ANIMALSCAPES AND EMPIRE:

NEW PERSPECTIVES ON THE IRON AGE / ROMANO-BRITISH TRANSITION

MARTYN GEORGE ALLEN

Thesis submitted to the University of Nottingham for the degree of Doctor of Philosophy

July 2011

Abstract

Human-animal relationships have long existed, across cultures, in many varied forms. The associations between the two are integral to the creation, form, use and perception of landscapes and environments. Despite this, animals are all too often absent from our views of ancient landscapes. Humans experience their diverse environments through a variety of media, and animals regularly play an important role in this type of exchange. Landscape archaeology commonly emphasises the influences of humanity upon the physical world. However, such engagement is rarely unilateral. Whether herding domesticated mammals, hunting quarry, or merely experiencing the range of fauna which populate the world, many of these interactions leave physical traces in the landscape: the form and location of settlements, enclosures, pathways, woodland, pasture, and meadows. Also, in more subtle ways, human and animal actors work together in performances through which people subconsciously generate their perceptions of landscape and environment. These physical and psychological animal landscapes have the potential to inform on human society and ideology. This thesis seeks to utilise zooarchaeological evidence to examine this concept. Animalscape research could be applied to any place or period but as a case study this project will explore, through animal bone analysis, how landscape and environment were used to negotiate cultural identity during the Iron Age/Romano-British transition, a pivotal but poorly understood period in British history.

Research focuses on a *c.*200 km^2 area of land bordering the West Sussex coast. This is a complex and singular locale, encompassing a number of Iron Age and Romano-British sites – most notably the elite settlement at Fishbourne which originated in the late Iron Age and developed, towards the end of the 1st century AD, into the largest 'Roman-style' domestic building north of the Alps. The site has been excavated a number of times in different areas since its discovery in 1960 until 2002; the various investigations producing a large quantity of animal bone. Yet this has, until now however, only been subjected to piecemeal analysis. The full re-analysis of the Fishbourne faunal assemblage is central to this project. To place these new data in their wider context, existing animal bone information from all pertinent published and 'grey' zooarchaeological literature is synthesised. The resulting datasets allow for a detailed examination of animal landscapes across the Iron Age/Romano-British transition at three nested scales: site and context; hinterland/region; and, Empire.

Integrating the zooarchaeological data with evidence from landscape and environment studies, Iron Age/Roman archaeology, ancient history and, most importantly, social anthropology is key to this project. A new theoretical framework is adopted here, whereby

animals are seen not simply as passive indicators of economy and environment but as active beings, providing visual, audio and physical experience, and it is through these novel approaches, by considering the human-animal-landscape relationship, that a new insight into the cultural changes of the Iron Age to Romano-British transition will be obtained.

Acknowledgements

This PhD thesis has been made possible by a Collaborative Doctoral Award funded by the Arts and Humanities Research Council. The University of Nottingham and the Sussex Archaeological Society are the two partners within the AHRCs Landscape and Environment Programme: a multi-disciplinary scheme designed to envelop and forward the variety of ways in which the study of landscape is undertaken. (Visit http://www.landscape.ac.uk/index for further details of the programme).

Archaeology is a study of the past, of people's lives, and it strives to encapsulate and divulge histories. The work contained in this thesis is similarly the result of a long voyage, one which tells many stories each hidden discretely amongst the visible text and figures. This journey contains a remarkable amount of personal change and only now, on reflection, can I fully recognise the unrepayable measure of debt and gratitude I owe my primary supervisor, Naomi Sykes. Not only is she a *tour de force* of academic zooarchaeology, with the ability to inspire and extract ideas from a mind which, at times, felt helplessly bare, but also for the emotional and pastoral care she provided when it was needed. I thank you.

A great deal of gratitude must also go to my secondary supervisor, Rob Symmons, the curator of Fishbourne Roman Palace, who spent many hours enhancing my work and my role at Fishbourne in a very enjoyable two years spent at the Palace whilst I collected far too much data. In this respect my thanks also go to the people and the institutions of Fishbourne Roman Palace and the Sussex Archaeological Society who made me feel welcome, provided financial support, and the kind of inside knowledge that can't be found in journals or artefacts. David Rudkin and John Manley are just two of too many names to mention. I must also single out James Kenny of Chichester District Council for taking time out to help me fill in many archival blanks and for discussion of local sites. Many other people have also provided impetus to this work, whether providing unpublished data or in helpful discussion, critique and enlightenment of my own research. In no particular order: Will Bowden, Gill Jones, Sylvia Warman, Kris Poole, Ed Oakley, Gareth Davies, Richard Carter, David Rudling, Tony King, Robin Bendrey, Kerry Harris, George Anelay, Simon Davis, Jessica Grimm, John Zant, Poly Baker, Peter Popkin, Fay Worley, and Andy Hammon.

Finally I want to thank my partners in life: my darling wife Anne and my newborn baby girl Cerys. Thankyou for putting up with my absences, my moans, my groans, and my 'lack of yardwork' – I dedicate this thesis to you both with love.

Contents

List of Figures

List of Tables

Chapter 1: Introduction

Iron Age and Roman societies have traditionally been considered as two different cultures, each separated by the single date of AD43 (*cf.* Branigan 1980; Cunliffe 1997; James 1999; Collis 2003; De la Bedoyere 2003; 2006). Because the two periods have been viewed as opposites they have, traditionally, attracted attention from equally different kinds of scholars: on the one hand Prehistorians, mostly interested in material culture, on the other, Romanists, tied to the historical sources and the study of epigraphy, and whose work embodies the model of Romanisation (Haverfield 1905; Hawkes 1959; Humphrey 1991; Cooley 2002; Birley 2005; see Creighton 2001 for an overview). For a long time the two stared at each other from across the divide of AD43 with few daring to cross the line – a situation that has resulted in superficial analysis of the transitional period (for overviews of the concept and its problems see Reece 1988; Hingley 1989, 3; 2005; Webster 1996; 2001; Barrett 1997; Mattingley 1997; 2006, 11-20; Woolf 1998, 1-24; 2002; Creighton 2000; 2001; 2006, 8-13; papers in Keay and Terrenato 2001, particularly James 2001).

In the last 20 years mainstream archaeologists have begun to explore the nature of the Iron Age-Roman transition (Millett 1990; Creighton 2000; 2006; Taylor 2007). Zooarchaeologists, however, have remained largely compartmentalised by the AD43 boundary. For instance, although Hambleton's (1999; 2009) and Dobney and Ervynck's (2007) extensive surveys of Iron Age animal bone data have significantly advanced our knowledge of the British economy, they cease at the end of the Iron Age. Conversely, King's (1978; 1984; 1999) reviews of livestock data cover the whole country, revealing evidence of acculturation, but deal almost exclusively with the Roman period – as does the work of Grant (1989). King's (2005) study of mammal bones from Romano-British temples extends the survey to include religious contexts; whilst Locker (2006) has comprehensively dealt with the fish remains, again focusing only on Roman-date sites. There are also many studies of urban zooarchaeology from Romano-British towns which examine the role of these administrative centres in the wider animal economy (Maltby 1979; 1993; O'Connor 1988; Dobney *et al.* 1996). In all, we have a range of excellent studies of Iron Age and Romano-British zooarchaeology which examine the respective economies, but minimal research that deals with the nature of the transition. This is despite the fact that many excavations have provided data that transcend the late Iron Age and early Roman boundary (*cf.* Ashdown and Evans 1981; Browne 1985; Wilson 1986; Coy 1987; Fifield 1988; Maltby 1987; 1995a; 1995b; Grant 2000; Hamilton 2000b; 2000d; Johnstone and Albarella 2002; Mulville and Levitan 2004; Allen 2006; Sykes 2007).

More recently, Albarella (2007; *et al.* 2008) has begun to synthesise data from both Iron Age and Romano-British sites to examine changes in livestock breeding and husbandry regimes. Again, this research substantially forwards our knowledge of the period. The work is, however, largely restricted in geographic remit and also in that it concentrates specifically on the economic aspects of the transition. Morris (2008) has also examined the zooarchaeology of the Iron Age/Romano-British transition, and from a broad geographical perspective, but his work has focused on one particular aspect of human-animal interactions: 'Associated Bone Groups' (ABGs). Importantly, Morris' work has highlighted the social importance of animals in human society – that they represent more than just 'meat' or 'products' and that their whole lives, not just the final moments of consumption, are culturally important. Overall, however, there is considerable scope for further zooarchaeological studies that examine not only the period as a whole but also consider animals from a social perspective.

This thesis joins the growing body of zooarchaeological work that considers animals to be actively influential in the ways people engage and understand the world. Their position and importance in human societies has long been accepted by social anthropologists and cultural geographers (*cf.* Leach 1964; Douglas 1966; Levi-Strauss 1966), and recent research has demonstrated the role animals play in giving structure and meaning to the world, whether this be, for example, as farm animals (Yarwood and Evans 2000), pets (Serpell 1986), animals of the hunt (Cartmill 1995), or urban dwellers (Philo 1995; Wolch 1998). Studies such as these clearly demonstrate that animals and landscapes are inextricably linked. However, despite the great quantity of related research, animals are almost completely absent in landscape archaeology. Part of the problem has been another traditional approach to the study of faunal remains: environmental reconstruction – a method which has been primarily focused on research into early prehistory (Beneke 1999; Lowe and Walker 1997; Roberts and Parfitt 1999; Schmitt, Madsen and Lupo 2002). This approach paints a somewhat disassociated picture of landscape as a background against which humans act out their lives. The perceived dichotomy between people and their environment is evident in zooarchaeological research dealing with domesticated animals in later periods; for example, Mainland (2008, 546) stated recently '...With the advent of animal domestication and the subsequent dominance of domesticates in many archaeological assemblages, the potential of faunal data to provide insight into past landscapes is much reduced...' Within this statement it is suggested that as animals *become* domesticated, becoming part of human society, they no longer inform us about the 'natural backdrop'. This perspective clearly hinges on the environmental reconstruction approach to landscape where only the physicality of land is the objective from the study of animal bone.

Research into the landscapes of Iron Age and Roman Britain seem to have ignored animals even further, placing them secondary to topics such as plant remains (Dark 2000), settlement patterns (*cf.* Taylor 2007) and pottery production (*cf.* Moore 2007). This is despite the corpus of zooarchaeological study, shown here at the outset, which demonstrates that animals must have been fundamental to everyday life in both periods, from the mundane to the extreme. Moore (2007) has recently argued that ancient landscapes cannot be divorced from the material culture they contained: the practice of making and distributing pottery in the Iron Age was fundamentally tied to the form of the surrounding landscape, where diverse social relationships were bound up with the materiality of the artefacts. If it is correct to place such emphasis on material culture then the same should be true, if not more so, for animals which, as living, moving, noise-making agents, could have had an even greater impact than material artefacts for providing people with a sense of the world (*cf.* Sykes 2009; Allen and Sykes forthcoming).

Here then, is the crux of my thesis, one which traditional formats of bone data cannot deal with in isolation: that people, animals and landscape work together to create culture. Whether they be living creatures or 'products' (meat, skin, horn, fat, milk, bones, etc.), the particular properties of animals, how they look, sound, smell, taste and feel, are important ingredients for human experience (Sykes 2009, 20). Breeding, rearing, killing, butchering and eating, are but some of the actions which bring the human and the animal together, providing meaningful associations between the two, and which can be specific to the places where they are carried out. Such events are fundamental to cultural identity because the ways that people act furnish a person, providing them with their place in the world (Bordieu 1977, 87).

The role of farming and the countryside in Iron Age and Roman Britain has been exhaustively studied by archaeologists through analysis of settlement patterns and various forms of material culture (Cunliffe 1991; Fowler 1983; see papers in Branigan and Miles 1988; Hingley 1989), animal bones (Grant 1989; Hambleton 1999; King 1984; 1999a; Maltby 1981; 1984), and archaeobotanical remains (Dark 2000; Jones 1981; 1982; 1996; van der Veen 1992; van der Veen and O'Connor 1998). And whilst the economic role of farming is well understood, farming as a social practice, one which constructs and shapes human identities is seriously lacking attention. The everyday movements and activities of people and livestock can be seen as an entwining of human and animal biographies; actions which create culture. This is a phenomenon which is generously discussed within anthropological and landscape-based studies (Abbink 2003; Evans and Yarwood 1995; Ivarsdotter 2002; Lorimer 2006; Pickard 2008). Such research has shown human/livestock cultures to be manifest within the landscape, being constructed as various groups of people and animals move through different spaces of particular size, shape and location. By encountering each other, these groups form emotional attachments, memories, shared experiences of landscape, and notions of place (Tilley 1994, 16). Such ideas show us that landscape is not segmented but is a continual matrix to be explored and understood (Ingold 2000, 190-191).

Whilst the Roman agronomists give very specific information in the rearing and management of animals under the care of the farm, objectively viewing them on the pages of the treatise, it is also clear that many of these writers viewed livestock in human terms. Virgil (*Geor.* 3.520), for example, describes an ox as grieving at the death of his comrade of the plough. Pliny (*Hist. Nat.* 8.19) also states that certain animals are beset with the ability to disseminate emotion and expression. Perceptions of animals in different societies are generally metaphorical of human-human relationships (Ritvo 1987, 10-15; Tester 1991; Serpell 1986, 23-42), so the ways animals are approached and engaged by people is reflective of the 'moral, material and technological developments' of each particular society (Gilhus 2006, 12). Whilst zooarchaeology is able to enlighten patterns of biodiversity in past environments, it is rarely discussed in terms of how much the range of taxa recovered from an archaeological site tells us about the relationships between people, animals, and their landscape. Environmental reconstruction and the consequences of human-animal behaviour are not cleanly separable through the archaeological study of animal bone, and it is important to recognise that although modern scientists aim to cleave a distinction between the two, the reality is that human, animals, and environments are intimately linked and need to be considered together (see also Dincauze 2000, 445-446; Lyman 1982). This has considerable consequences because, from an anthropocentric point of view, human societies impose structure upon the elements which they sense around them, placing everything into categories such as 'cultural' and 'natural', 'domestic' and 'wild', categories clearly immersed with environmental associations (Bradley 2005, 34). Although none of these terms have universal applicability, most societies conceptually organise their world: individual groups involve local experience in their perception of the environment. It is these 'worldviews' which direct human actions towards the landscape and its other inhabitants (Ingold 2000, 15).

Of course worldviews are fluid and reflexive. They can alter over time when changes to the environment take place, contemporaneously conferring new meaning upon the landscape. An elegant example of this point lies in the 'new' suite of animals which were imported to Britain during the Iron Age and Roman period: domestic fowl (Poole 2010), rabbits (Sykes and Curl 2010), fallow deer (Sykes 2010), and rats (Reilly 2010). Each of these animals was imported for different reasons and their presence embodied particular meanings which could influence how people engaged specific landscapes. Fallow deer *Dama dama*, for example, have been shown to have been imported to Britain in the 1st Century AD right at the point of transition from Iron Age to Roman Britain (Sykes *ibid.*). Their remains have been recovered predominantly at villa sites, the significance of which has been suggested to display the social and political importance of the owners of rural centres through the possession of exotic animals. The largest and most extravagant of the settlements known to have kept a herd of fallow deer on its property is Fishbourne Palace in West Sussex (Sykes *et al.* 2006a), and it is at this complex site that this thesis takes its point of departure.

1.1 Data Collection and Geographic Scale

The first two years of my PhD research was based at Fishbourne Roman Palace Museum where I carried out primary analysis of the animal bones excavated after the discovery of the site in the 1960s as well as a number of smaller excavations which have taken place since. Due to the number of excavations carried out at this site since the 1960s there has been a largely corresponding quantity of faunal assemblages produced. These collections have been studied and reported on in a variety of ways. The material from the latest excavations, between 1995 and 2002, has been fully examined and published (Sibun 2003; Sykes 2005; Sykes *et al.* 2006b). By contrast, the report for the 1960s assemblage includes the examination of a sample of the remains (Grant 1971; Eastham 1971). There are also many small sites where material was collected though have not undergone any specialist examination. Further details of these assemblages are provided in Chapter 3.

The irregular nature of the entire faunal assemblage has created an inconsistent and disarticulated view of the remains from the site. Furthermore, the methods used in analysing animal bone have developed since the original excavations of the site in the 1960s. To rectify these problems I completely re-analysed all the material from the 1960s assemblage, and I freshly analysed all remaining collections which had previously been untouched. The analytical methods employed in this thesis are displayed in Chapter 2. In order to bring the data from these assemblages together with that from the later excavations I created an Access database within which to collate and process all the data together. My work on the faunal remains has brought the analysis of all the material up-to-date using modern zooarchaeological methods and has joined all disparate datasets within a single database for analysis. This work satisfied one of the principle aims of the original research proposal of the thesis which envisioned the importance of the Fishbourne assemblages being viewed in a holistic fashion, enabling new perspectives of the faunal remains to be extracted.

The collaborative nature of my PhD, with the Sussex Archaeological Society, has enhanced the sense of responsibility I have for disseminating the data and results produced in this work in a clear and accessible format making it useful to a wide variety of audiences – academic, commercial and public. Away from Fishbourne Palace, a core part of my work has been to collect faunal data from both published reports and grey literature to build up a second dataset from sites across the country. Again my methods of analysis are presented in Chapter 2. The rationale for collecting two sets of data, both primary and secondary, is so that the research questions of my thesis can be approached at three nested scales: a micro-scale analysis which deals with the site at Fishbourne including comparisons to other sites in the immediate hinterland; a meso-scale analysis of sites over two larger areas from southern England; and the macro-scale which includes sites from across the country.

1.1.2 Micro-Scale

The micro-study research area encompasses a *c.*200 km^2 area of land which encompasses part of the coastline of West Sussex and eastern Hampshire, including the estuaries at the edge of the Solent (Figure 1). Inland lies a large area of coastal plain which sits south of an extensive linear band of chalk downland, known today as the South Downs. The full extent of this downland runs from Wiltshire to East Sussex. The area under examination centres upon the late Iron Age/Roman site at Fishbourne (Figure 2). Fishbourne lies at the head of the eastern-most estuary of a series of sheltered inlets. It is situated on the coastal plain, *c.*1 miles west of the modern city of Chichester, and *c.*3 miles south of the South Downs.

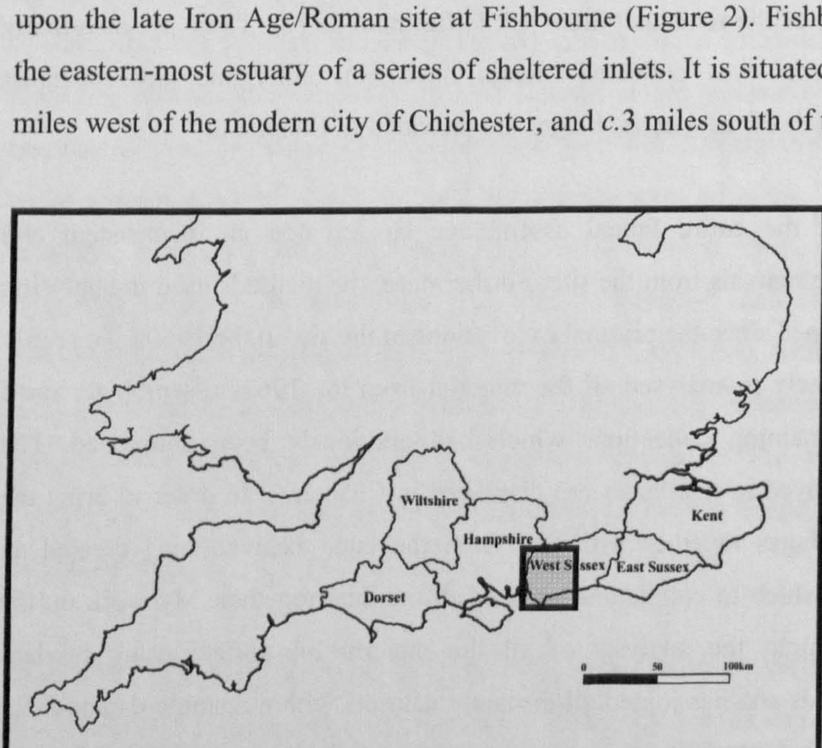


Figure 1; Limits of micro-study research area on modern county map.

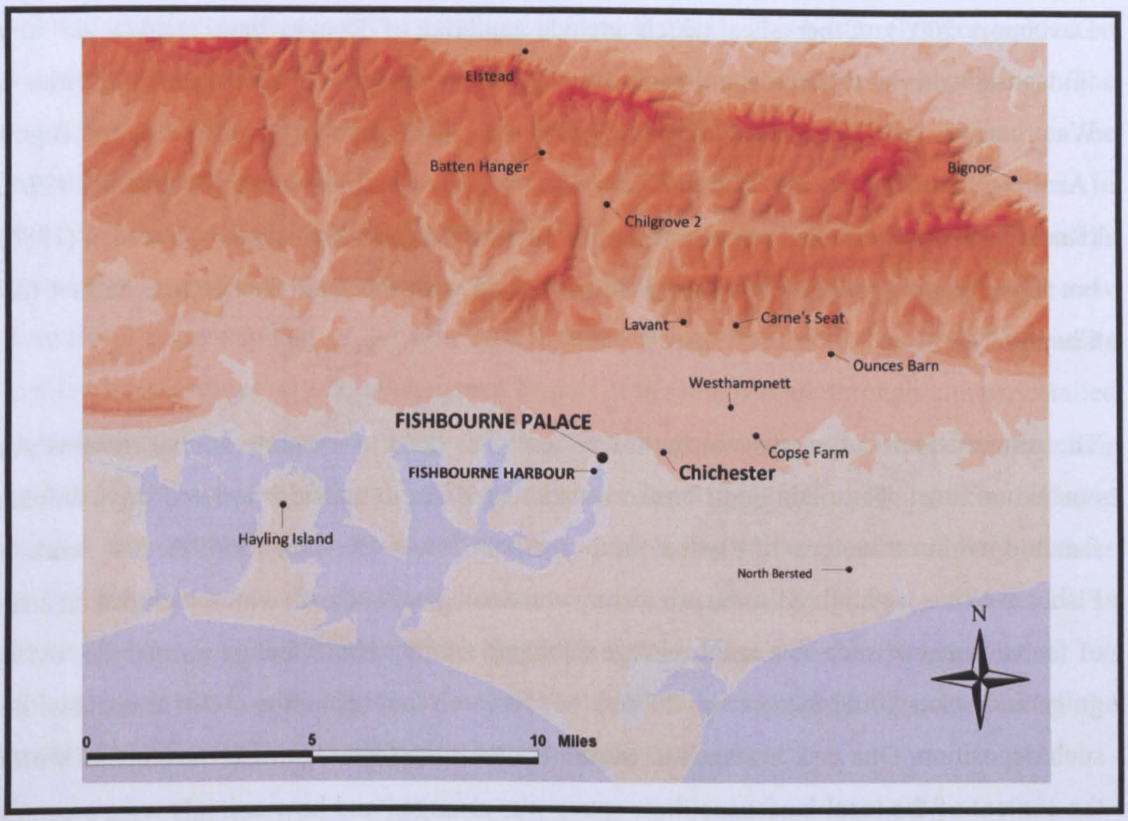


Figure 2; Distribution of sites analysed in micro-study research area, plotted by GIS including local topography.

Activity at Fishbourne is known to have begun prior to AD43 and is thought to continue through to, at least, the late 3rd century AD (Cunliffe 1971; Manley and Rudkin 2003). The hinterland surrounding these settlements also includes several other sites dating to the late Iron Age and the Roman-British period which have produced sizable and published faunal assemblages. Two late Iron Age rural farmsteads have been excavated on the coastal plain, one at North Bersted (King and Bedwin 1978) and another at Copse Farm in Oving (Browne 1985). A further farmstead site has been located near the village of Lavant, a site which showed evidence of continuity into the 2nd century AD. The faunal remains from this site have been analysed personally. On the downland, the hillside enclosure at Carne's Seat produced material dating to the period of transition (Holgate 1986). On Hayling Island, west of Fishbourne a large multiphase religious site has been excavated, including a large quantity of animal bone (King and Soffe 2001; King 2005).

A significant quantity of animal bone has been excavated from Roman phases at Chichester, which became the *civitas* capital *Noviomagus regnensis* during the early Roman period, from the sites at Cattlemarket (Levitan 1981), Rowes Garage (Knight 2007), and Lavant Culvert (Hamilton-Dyer 2003). There has been the suggestion that Chichester was the site of a pre-Roman Iron Age oppidum though firm evidence for this is currently lacking (Cunliffe 1973;

Davenport 2003). Other sites which include material of Roman date include the rural 'industrial' site at Ounces Barn, Goodwood (Bedwin and Place 1995), and the villas at Watergate Hanger, Batten Hanger (both Hunter n.d.), Chilgrove 2 (Outen 1979), and Bignor (Armitage *et al.* 1995). An isled-hall villa was excavated in Fishbourne Harbour in 1982/83 (Rudkin 1986). The faunal remains from this site were originally analysed by French (1986), but have been re-analysed by myself and included with the main Fishbourne dataset (see Chapter 3).

The primary focus of analysis at the micro-scale has been to examine animal remains at a contextual level. The main questions to be addressed are to consider in what ways animals featured within concepts of 'space' and 'memory' over the transition. Recent work at Fishbourne has highlighted some interesting archaeological contexts which included an array of faunal remains, such as a late Iron Age ditch and another linear feature termed the 'oyster gully' (*cf.* Sykes 2005; Sykes *et al.* 2006b). My research focuses on the use of animals within such deposition. One task has been to examine what such features might have meant within the context of the local landscape: how space was arranged and how animals were a central component in this process. Spatial analyses of animal deposition from single settlements have been researched previously, most notably by Wilson (1996), and the intension of my analysis is to examine the role of animals, both living and as body parts, in giving meaning to space. In this sense, the disposal of animals is important in structuring the ways that people moved through and perceived their immediate landscape. Of course, space is intimately bound up with the movement of time, a fundamental aspect of all landscapes (*cf.* Gosden 1994; 1997) and the production and maintenance of landscape features during the Iron Age are argued to have been used to construct memory (*cf.* Bevan 1997). Hill's (1995, 123-125) pioneering work on ditches and pits in the Iron Age of Wessex has shown that the digging of these features was important for producing and maintaining communal identity by constructing localised histories. By focusing on a range of zooarchaeological data, I aim to consider the variety of activities, from birthing, rearing and breeding, to killing, dismembering and distributing, to examine how such actions might have been knitted into local landscapes both in regard to how the settlement developed spatially and in the incorporation of memory through landscape.

Whilst zooarchaeology has been used to examine the link between animals and social status/ethnicity such studies have commonly focused upon meat diet (Izjereef 1989; King 1999a). The role of 'new' or rare animals in particular spaces is a primary issue which needs to be tackled in this thesis. The historical literature divulges a wealth of information regarding the construction of villa estates within 'natural' landscapes, exploiting local wildlife in order to enhance social prestige (*cf.* Purcell 1996). This has rarely been tackled on a zooarchaeological level (though see Sykes 2009; Allen and Sykes forthcoming). The concept of landscape spaces, such as parks and gardens, have been argued to be representative of the Roman Empire (Sykes *et al.* 2006a), and this idea will be examined in the wider context of Imperial landscapes. These phenomena demonstrate that animals permeated beyond everyday activities such as animal husbandry regimes, and provide new avenues of understanding of the Iron Age/Romano-British transition. The issue of animals and landscape spaces will be investigated further at the micro-scale through a more detailed examination of the species frequency of rare or exotic species, such as fallow deer, and their archaeological context. Animal parks would have held particular meanings for different people, transmitting different cultural messages. According to the literature, many of these spaces also existed in the rhetorical landscape being discussed by Roman authors such as Varro (*De Re Rus.* 3), evidence which reignites the old adage *animals are good to eat but also good to think with.* My work seeks to address this issue further by considering the importance of animals in cosmological as well as physical spaces.

Taking the assumption that landscape creates people as much as people create landscape, the act of importing an exotic animal is driven by people wanting to express their identity. Once in place however, that animal would have a particular cultural meaning for anyone wishing to engage with it. Variations in evidence between sites within a micro-scale landscape would indicate the presence of individual group identities, and my work is seeking to understand if these changed through time. Of course this does not have to be exceptional examples of imported exotica but in everyday practices like shepherding or cattle-ranching. Such practices can be looked at on a much wider scale to examine whether cultural landscapes were formed over larger areas.

1.1.3 Meso-Scale

I have examined data from a range of sites over wider geographic areas in order to establish similarities and differences in livestock farming between neighbouring sites. Viewing data on topographical maps enables us to pay closer attention to the environment, providing opportunities to examine people who dwelt within specific types of landscape. This is not to say that the environment determines the way that people lived, nor is it intended to suggest that regional groups did not transcend such environments. My analysis here concerns patterns of livestock husbandry as a form of human-animal practice specifically within those environments.

The construction of 'regional' identity and social boundaries is the foremost question to be addressed at the meso-scale. Regional analyses of archaeological data are becoming more common (*cf.* Hambleton 1999; Taylor 2007). In such studies 'regions' tend to be defined using modern boundaries and the archaeological data therein is used to observe geographically-concise patterns. It is difficult to see whether modern geographical divisions are applicable when imposed upon ancient landscapes as these are unlikely to have existed in their modern form during the Iron Age or Roman period, particularly if they take no account of the physical landscape. Grouping data in this way may give misleading information for areas when a variety of different social groups lived within *regions*. I have examined data at the meso-scale in order to view spatial patterns prior to the setting up of boundaries. The analysis of social boundaries has a long history in archaeological study, such as differences in ethnicity (Jones 1997, 117-119; Dietler and Herbich 1998; Lucy 2005). My work focuses on animal husbandry as a form of human behaviour and I aim to examine the place and form of farming identity over the transition.

1.1.4 Macro-Scale

The examination of zooarchaeological data at the macro-scale is intended to investigate the role and affect, if any, of the Roman Empire upon the wider British landscape. The assumption employed here is that people, animals, landscape, social structure and worldviews are directly connected: a change in one must cause a shift in another. Imperialism could affect native culture to a degree, not necessarily by 'Romanisation' which suggests a homogenising of culture (*cf.* Barrett 1994; Hingley 2005), but by observing human-animal relationships as representative of culture. This level of analysis is intended to explore how varied human-animal relationships enabled common landscapes to be traversed and perceived differently according to identity, whether through status, gender or ethnicity.

To do this effectively an integrated approach to the data is needed, one which weaves together zooarchaeological data, Iron Age/Roman archaeology, ancient history, and social anthropology. It is well known that cattle frequencies increased in Britain over the transition, a shift commonly interpreted within economic perspectives (King 1984; 1999a; Albarella 2007). My aim is to pay closer attention to the social values given to animals at this time. For example, Roman history attests to the naming of Italy deriving from the ancient Greek *itali*, meaning cattle, being bestowed upon Italy due to its quantity and quality in cattle (Schwabe 1994, 46). What does this mean for the increasing frequency of cattle in Britain going into the Roman period? Is it possible that cattle-dominated landscapes were not simply a reaction to shifting economies, but the sight, sound and smell of them brought with it wider images of

Empire? The animal economies of Iron Age and Roman Britain have much wider social consequences which are rarely, if ever, considered in zooarchaeological analyses. I seek to address this oversight.

Away from domesticated animals, there is a long held belief that there was an increase in wild animal exploitation post-conquest (Grant 1981; King 1991). The presence of hunting imagery and depictions of the 'wild' on material culture and in literary sources became more common into the Roman period indicating that there may have been a change in perceptions of nature, particularly with elite groups. Despite this, little attention has focused upon whether hunting was the reserve of elite groups or whether wild animals were exploited by Iron Age/Romano-British society in general. My aim here is to examine the evidence for wild animal exploitation across the transition using both zooarchaeological and archaeological evidence. Studies have shown that hunting in agricultural societies is commonly used as a mechanism for negotiating and displaying political authority (Lane-Fox 1996; Hamilakis 2003). Social and religious beliefs would also have played a major role in how local environments were approached and engaged. It is therefore imperative to better understand the link between the spaces where rural settlements were situated and the animal resources the inhabitants exploited. The landscape may have been used, indeed structured, so that ideas of nature were psychologically incorporated into local environments and visually demonstrated through specific human-animal interactions. Spaces used for hunting, fowling and fishing may have been considered as realms where deviant activities, such as rites of passage or links with the divine, could have been played out. Thus these types of human-animal-landscape relationship can symbolise social differences within communities.

Before analysis of these research aims can commence, an understanding of the sites from which data has been collected is needed. There are a great number of sites which have been used in this thesis and their range involves a substantial variety in the ways that settlements functioned, the identities of the people who lived in them, the physical landscapes where they were situated, and the length of time they were inhabited. The next section reviews the sites analysed and discussed in this thesis.

1.2 The Sites: Distribution, Chronology and Type

In total, 282 sites provided faunal remains data. A comprehensive list of each site is given in Table 1 and the distribution of each is displayed geographically in Figure 3. The sites examined cover the length and breadth of England and Wales though the vast majority of sites are situated in the south of England. There is a relative scarcity of sites in Wales, the

Midlands and northern England. The regional analysis in Chapter 5 instead focuses on areas in the south of England where a larger number of sites produced faunal remains. In the macro-scale dataset, there are small gaps in data where particular environments were either uninhabited during the Iron Age and Roman period or where the excavation of animal bone has been limited, such as the Weald, Dartmoor and Exmoor. The sites examined in the micro-study area have been detailed above. These sites are also included in the meso- and macro-scale analyses. The geographic areas used in the meso-scale analysis include a large proportion of the Hampshire South Downs and surrounds and, secondly, an area encompassing the Upper Thames Valley, the Severn Valley and the Cotswolds. More specific maps and site distributions for each of these are provided in Chapter 5 immediately prior to data analysis.

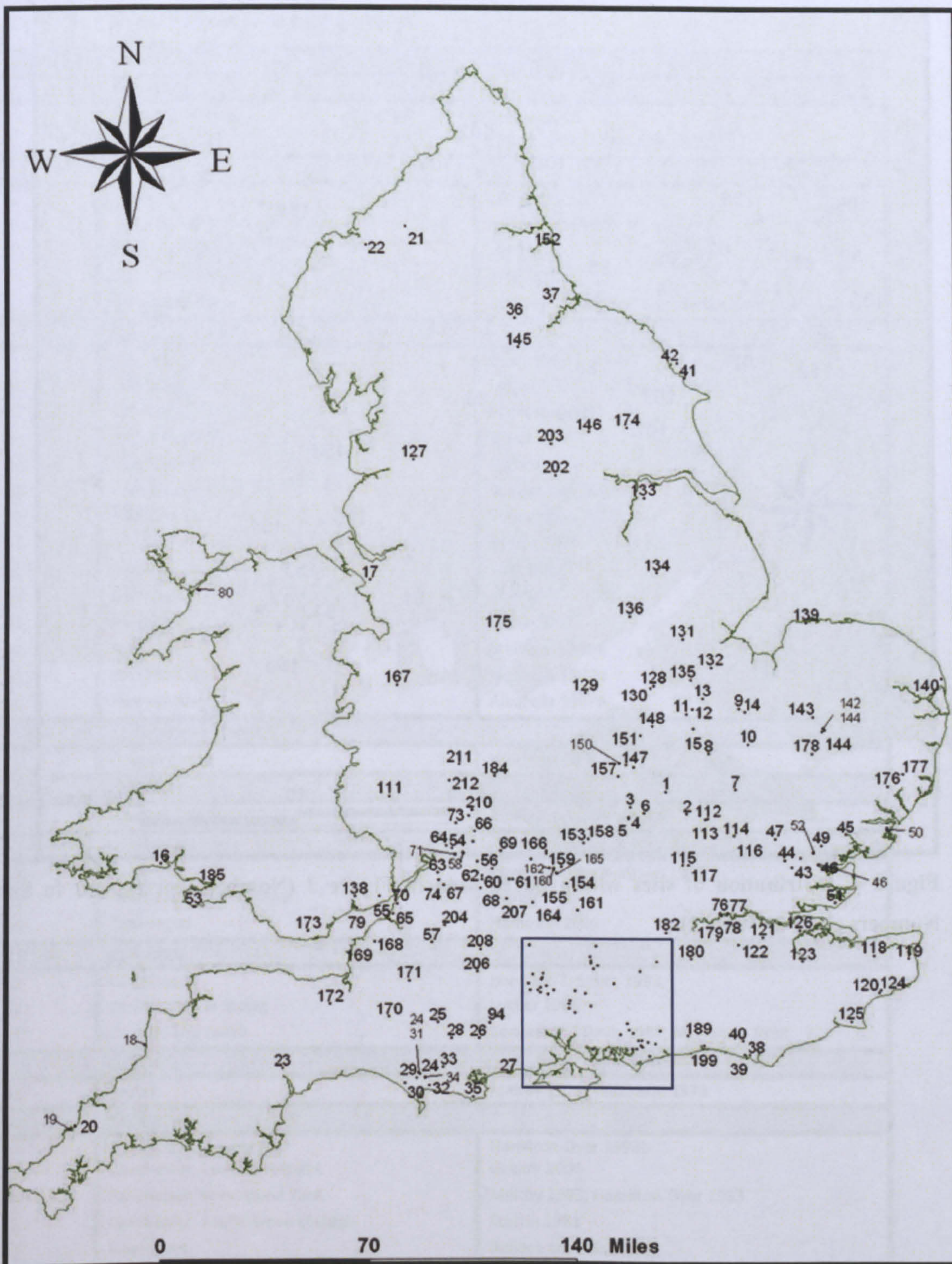


Figure 3; Distribution map of sites used in this thesis - boxed area reproduced in Figure 4 (Numbers correspond to Site Numbers given in Table 1).

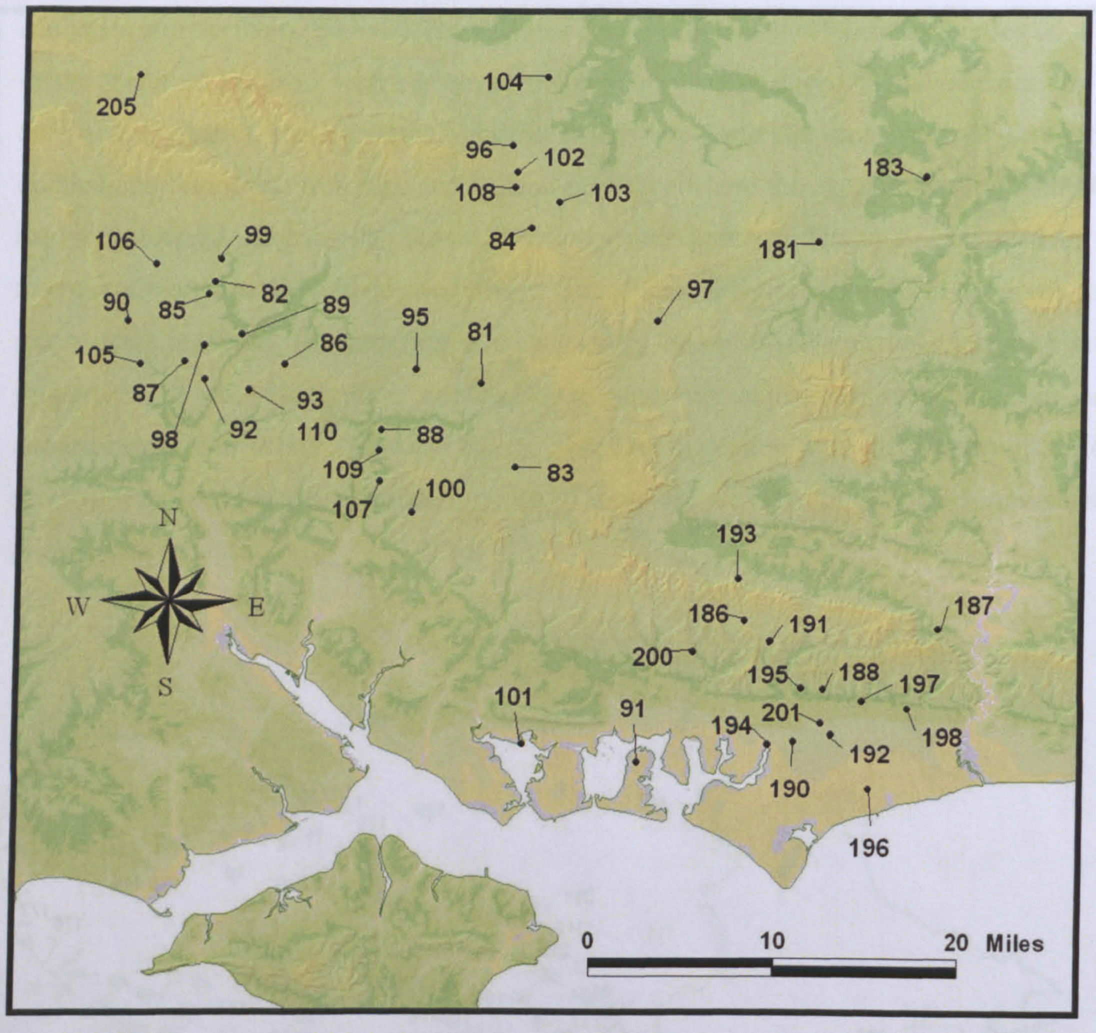


Figure 4, Distribution of sites within boxed area in Figure 3 (Numbers correspond to Site Numbers given in Table 1).

Table 1; List of sites covered in this study.

SITE NO.	SITE	REFERENCE
	BEDFORDSHIRE	
1	Biddenham Loop	Maltby 2008
2	Meppershall	Locker 2004 (after Locker 2007)
	BUCKINGHAMSHIRE	
3	Bancroft	Levitan 1994
3	Bancroft, temple-mausoleum	Holmes and Reilly 1994
4	Kingsmead South	Ingrem 2009
5	Oxley Park West	Strid 2009
6	Wavendon Gate	Dobney and Jaques 1996; Reilly 1996
	CAMBRIDGESHIRE	
7	Edix Hill	Davis 1995
8	Godmanchester	Locker 1993 (after Locker 2007)
9	Grandford	Stallibrass 1982
10	Haddenham III, Snow's Farm	Beech 2006
10	Haddenham IV	Higbee 2006
10	Haddenham V	Serjeantson 2006a
10	Haddenham VI	Serjeantson 2006b
11	Haddon	Baxter 2003
12	Orton Hall Farm	King 1996
12	Orton Longueville	King 2001
13	Parnwell	Poole 2008
14	Stonea	Stallibrass 1996
15	Tort Hill East	Albarella 1997b
15	Tort Hill West	Albarella 1997b
	CARMARTHENSHIRE	
16	Coygan Camp	Westley 1969
	CHESHIRE	
17	Chester, Dee House	Jones 2001 (after Locker 2007)
	CORNWALL	
18	Duckpool	Powell and Serjeantson 1995
19	Newquay, Atlantic Road	Ingrem n.d.
20	Travelegue	Hammon 2005
	CUMBRIA	
21	Birdoswald	Izard 1997; Smith 1993
22	Carlisle, Castle Street	Locker 1985
22	Carlisle, The Lanes	Connell and Davis 1998; Nicholson 1993
	DEVON	
23	Exeter	Maltby 1979; Wilkinson 1979
	DORSET	
24	Dorchester, County Hall	Hamilton-Dyer 1993b
24	Dorchester, County Hospital	Grimm 2006
24	Dorchester, Greyhound Yard	Maltby 1993; Hamilton-Dyer 1993
24	Dorchester, South Grove cottage	Startin 1981
25	Flagstones	Bullock and Allen 1997
26	Gussage All Saints	Harcourt 1979
27	Hengistbury Head	Grant 1987
28	Hod Hill	Fraser 1968
29	Maiden Castle	Armour-Chelu 1991
30	Manor Farm	Sykes 2002
31	Poundbury	Buckland-Wright 1987
32	Poxwell	Jones 1986
33	Tolpuddle Ball	Hamilton-Dyer 1999
34	Whitcombe	Buckland-Wright 1990
35	Worth Maltravers, Compact Farm	Clark n.d.
	DURHAM	
36	Piercebridge	Rackham and Gidney 1984

SITE NO.	SITE	REFERENCE
	DURHAM continued	
37	Thorpes Thewles	Rackham 1987
	EAST SUSSEX	
38	Bishopstone	Gebbels 1977; Jones 1977
39	Newhaven	Gebbels 1976
40	Ranscombe Hill	Bedwin 1978
	EAST RIDING	
41	Carr Naze	Dobney *et al.* 2000
42	Rudston	Chaplin and Barnetson 1981
	ESSEX	
43	Chelmsford, mansio site AR	Luff 1988
43	Chelmsford, site AA	Luff 1988
43	Chelmsford, site S	Luff 1988
43	Chelmsford, site T	Luff 1988
43	Chelmsford, temple site	Luff 1992
44	Chignall	Luff 1998
45	Colchester, Balkerne Heights	Grimm 2007
45	Colchester, Balkerne Lane	Luff 1993
45	Colchester, Culver Street	Luff 1993; Locker 1992a
45	Colchester, former post office	Locker 2002 (after Locker 2007)
45	Colchester, Gilberd School	Luff 1993; Locker 1986a
45	Colchester, Sheepen	Luff 1985
46	Elms Farm	Johnstone and Albarella 2002
47	Great Dumnow	Luff 1988
48	Great Holts Farm	Albarella 2003; Locker 2003
49	Kelvedon	Luff 1987
50	Little Oakley	Cornwall and Meddens 2002
51	North Shoebury	Levine 1995
52	Witham	Luff 1999
	GLAMORGAN	
53	Minchin Hole Cave	Branigan *et al.* 1993
	GLOUCESTERSHIRE	
54	Abbeymead	Levitan 1989b
55	Avonmouth	Grimm 2006
56	Barnsley Park	Noddle 1985; Webster 1985
57	Bath	Grant 1985
58	Birdlip	Dobney and Jaques 1990
59	Charlton Kings	Noddle 1991
60	Cirencester	Thawley 1982; Maltby 1998
61	Claydon Pike, Longdole's Field	Sykes 2007
61	Claydon Pike, Warrens Field	Sykes 2007
62	Ditches	Reilly 1988
63	Frocester	Noddle 2000; Bramwell 2000
64	Gloucester, Coppice Corner	Levitan 1989c
65	Hallen	Hamilton-Dyer 2002
66	Haymes	Noddle 1986
67	Kingscote	Maltby 1998
68	Neigh Bridge	Evans 2007
69	Norbury Camp	Levitan 1983
70	Northwick	Hamilton-Dyer 2002
71	Portway	Noddle 1984
72	Spratsgate Lane	Ingrem n.d.
73	Tewkesbury	Hambleton 2004
74	Uley Bury	Levitan 1983
74	Uley Shrines	Levitan 1993
75	Whelford Bowmoor	Harman 2007

SITE NO.	SITE	REFERENCE
	GREATER LONDON	
76	London, 2-5 Devonshire Square	Liddle 1988 (after Locker 2007)
76	London, amphitheatre	Bateman 1997
76	London, Billingsgate buildings	Wheeler 1974
76	London, Billingsgate fish market	Locker 1992b (after Locker 2007)
76	London, Fleet Valley	Locker 1994 (after Locker 2007)
76	London, Leadenhall Court	Locker 1992c (after Locker 2007)
76	London, Peninsula House	Bateman and Locker 1982
76	London, Rangoon Street	Locker 1986b (after Locker 2007)
76	London, Walbrook Mithraeum	Macready and Sidell 1998
77	Shadwell	Reilly and Ainsley 2002
78	Southwark, 1-7 St Thomas Street	Jones 1978
78	Southwark, 199 Borough High Street	Jones 1988b
78	Southwark, Babe Ruth Bathhouse	Armitage 2005a (after Locker 2007)
78	Southwark, Borough High Street	Ainsley 2002
78	Southwark, Calverts buildings	Locker 1991 (after Locker 2007)
78	Southwark, Fennings Wharf	Locker 1992c (after locker 2007)
78	Southwark, Kings College	Armitage 2002a
78	Southwark, Lefevre Road	Locker 1998a (after Locker 2007)
78	Southwark, Long Lane	Armitage 2000a (after Locker 2007)
78	Southwark, Parnell Road	Locker 1998b (after Locker 2007)
78	Southwark, Southwark Cathedral	Armitage 2000b
78	Southwark, Swan Street	Armitage 2002b (after Locker 2007)
78	Southwark, Tobacco Dock	Armitage 2005b (after Locker 2007)
78	Southwark, Winchester Palace	Reilly 2005
	GWENT	
79	Nash	Meddens 2001
	GWYNEDD	
80	Caernarfon	Noddle 1993; O'Connor 1993
	HAMPSHIRE	
81	Abbotstone Down	Maltby 1986
82	Balksbury Camp	Maltby 1995b
83	Bramdean	Clutton-Brock 1982
84	Brighton Hill	Maltby 1995a
85	Bury Hill	Hamilton 2000a
86	Chilbolton Down	Maltby 1984
87	Danebury	Grant *et al.* 1991; Serjeantson 1991
88	Easton Lane	Maltby 1987
89	Fullerton	Hammon 2008d
90	Grateley South	Hammon 2008c
91	Hayling Island	King 2005
92	Houghton Down	Hamilton 2000d; Hammon 2008b
93	Little Somborne	Locker 1979; Maltby 1984
94	Martin	Rixson 1984
95	Micheldever Wood	Coy 1987
96	Monk Sherborne	Ingrem n.d.
97	Neatham	Done 1986
98	Nettlebank Copse	Hamilton 2000c
99	Old Down Farm	Maltby 1981
100	Owslebury	Maltby 1987
101	Portchester	Grant 1975; Eastham 1975
102	Rooksdown	Powell and Clark 1996
103	Rucstalls	Gregory 1978
104	Silchester, defences	Maltby 1984
104	Silchester, forum basilica	Grant 2000; Serjeantson 2000; Hamilton-Dyer 2000
104	Silchester, insula IX	Ingrem 2006

SITE NO.	SITE	REFERENCE
	HAMPSHIRE continued	
105	Suddern Farm	Hamilton 2000b
106	Thruxton	Hammon 2008e
107	Twyford Down	Powell, *et al.* n.d.
108	Winklebury Camp	Jones 1977
109	Winnall Down	Maltby 1985a
110	Woolbury	Roncaglia and Grant 2000
	HEREFORDSHIRE	
111	Sutton Walls	Kenyon 1954
	HERTFORDSHIRE	
112	Baldock	Chaplin and McCormick 1986
113	Blackhorse Road	Legge 1988
114	Braughing	Fifield 1988
115	Gorhambury	Locker 1990
116	Skeleton Green	Ashdown and Evans; Ashdown; Wheeler: all 1981
117	St Albans, Folly Lane	Locker 1999
	KENT	
118	Canterbury Castle	King 1982
119	Dickson's Corner	Reilly 2000
120	Dolland's Moor	Bendrey 2002
121	Farningham Hill	Locker 1984
122	Keston	Locker 1991
123	Mount Roman villa	Bendrey 1999
124	Peene	Bendrey 2002
125	Scotney Court	Irving 1998
126	Wainscott	Bendrey 2002
	LANCASHIRE	
127	Ribchester	Stallibrass and Nicholson 2000
	LEICESTERSHIRE	
128	Empingham	Morrison 2000
129	Leicester, Little Lane	Gidney 1991
130	Renner's Park, well	Morrison 2000
	LINCOLNSHIRE	
131	Billingborough	Iles 2001
132	Cowbit	Albarella and Mulville 2001
133	Dragonby	Harman 1996; Jones 1996
134	Lincoln	Dobney *et al.* 1996
135	Market Deeping	Albarella 1997
136	Pasture Lodge Farm	Harman 1994
	MONMOUTHSHIRE	
137	Caerwent	Noddle 1983
	NEWPORT	
138	Caerleon, baths	O'Connor 1986
138	Caerleon, scamnum tribunorum	Hamilton-Dyer 1993a
	NORFOLK	
139	Brancaster	Jones, Langley and Wall 1985
140	Burgh Castle	Grant 1983
141	Caistor-on-sea	Harman 1993
142	Kilverstone	Higbee 2006
143	Stanford, Lynford Quarry	Curl 2005
144	Thetford	Nicholson 1995
	NORTH YORKSHIRE	
145	Catterick, Bainesse	Stallibrass 2002
145	Catterick, bypass	Stallibrass 2002
145	Catterick, Catterick Bridge	Meddens in Stallibrass 2002
145	Catterick, Thornbrough Farm	Stallibrass 2002

SITE NO.	SITE	REFERENCE
	NORTH YORKSHIRE continued	
146	York, Fishergate	Enghoff 2000
146	York, General Accident site	O'Connor 1988
146	York, St Mary Bishophill Junior	Jones A.K.G. 1988
	NORTHAMPTONSHIRE	
147	Blackthorn	Orr 1974b
148	Brigstock	Biek and Cripps 1963
149	Clay Lane	Jones *et al.* 1990
150	Moulton Park	Orr 1974a
151	Weekley	Whatrup and Jones 1988
	NORTHUMBERLAND	
152	Wallsend	Gidney 2003
	OXFORDSHIRE	
153	Alchester	Thomas 2008
154	Appleford	Wilson 1980; Bramwell 1980
155	Ashville Trading Estate	Wilson 1978
156	Asthall	Powell *et al.* 1997
157	Barton Court Farm	Wilson 1986
158	Bicester Fields Farm	Charles 1999
159	Farmoor	Wilson 1979
160	Gravelly Guy	Mulville and Levitan 2004
161	Lowbury Hill	Hamilton-Dyer 1994
162	Mingies Ditch	Wilson 1993
163	Shakenoak	Cram 1973 and 1978
164	Uffington White Horse	Ingrem 2003
165	Watkins Farm	Wilson and Allison 1990
166	Wilcote	Hamshaw-Thomas 1993
	SHROPSHIRE	
167	Wroxeter, baths basilica	Locker 1997a; Meddens 2000
167	Wroxeter, fortress	Noddle and O'Connor 2002
	SOMERSET	
168	Cadbury Congresbury	Noddle 1992
169	Henley Wood	Jones 1996
170	Ilchester	Levitan 1982
170	Ilchester, Great Yard	Barber 1995; Locker 1997b (after Locker 2007)
171	Shepton Mallet	Pinter-Bellows 2001
172	Yarford	Allen 2006
	SOUTH GLAMORGAN	
173	Whitton	Kinnes 1981
	SOUTH YORKSHIRE	
174	Grimthorpe	Jarman and Fagg 1968
	STAFFORDSHIRE	
175	Rocester	Hammon 2000g
	SUFFOLK	
176	Burgh	Jones, Sly, Beech and Parfitt 1988
177	Hacheston	King 2004
178	West Stow	Crabtree 1989
	SURREY	
179	Beddington, well	Locker n.d. (after Locker 2007)
180	Hawk's Hill	Carter and Phillipson 1965
181	Runfold	Powell and Clark n.d.
182	Thorpe Lea	Iles and Clark n.d.
183	Worplesdon	Poulton 2005
	WARWICKSHIRE	
184	Alcester	Ayres and Clark 2000; Maltby 2001
184	Alcester, AES 76-7	Maltby 2001

SITE NO.	SITE	REFERENCE
	WARWICKSHIRE continued	
184	Alcester, defences	Hamilton 1996
	WEST GLAMORGAN	
185	Loughor	Sadler 1997
	WEST SUSSEX	
186	Batten Hanger	Hunter n.d.
187	Bignor	Armitage *et al.* 1995
188	Carne's Seat	Beech 1986
189	Chanctonbury Ring	Sibun 2001
189	Chanctonbury Ring, temenos ditch	Bedwin 1980
190	Chichester, Cattlemarket	Levitan 1989a
190	Chichester, Chapel Street	Locker 1981 (after Locker 2007)
190	Chichester, Lavant Culvert	Hamilton-Dyer 2004
190	Chichester, Rowes Garage	Knight 2007
191	Chilgrove 2	Outen 1979
192	Copse Farm	Browne 1985
193	Elstead	Saunders 1980
194	Fishbourne, Palace (1960-68)	personally collected
194	Fishbourne, east (1995-2002)	Sykes 2005; Sykes *et al.* 2006b
194	Fishbourne, Harbour	personally collected
194	Fishbourne, Westward House	personally collected
194	Fishbourne, small sites	personally collected
195	Lavant	personally collected
196	North Bersted	King and Bedwin 1978
197	Ounces Barn	Bedwin 1995
198	Selhurst Park	Personally collected
199	Slonk Hill	Sheppard 1978
200	Watergate	Hunter n.d.
201	Westhampnett	Smith and Serjeantson 2008
	WEST YORKSHIRE	
202	Dalton Parlours	Berg 1990
203	Castleford	Berg 1999
	WILTSHIRE	
204	Bury Wood Camp	Bunting, Verity and Cornwall 1963
205	Castle Copse	Payne 1997; Allison 1997; Jones 1997
206	Chapperton Down	Ingrem n.d.
207	Groundwell Farm	Coy 1981
208	Wayside Farm	Ingrem n.d.
	WORCESTERSHIRE	
209	Aston Mill Farm	Lovett 1990
210	Conderton Camp	Iles and Clark 2005
211	Droitwich, Bays Meadow	Noddle 2006; Bramwell 2006
211	Droitwich, Dodderhill	Davis 2006
211	Droitwich, Hanbury Street	Locker 2006
212	Worcester, Deansway	Nicholson and Scott 2004
212	Worcester, Sidbury	Scott 1990

The main focus of this thesis is the Iron Age/Romano-British transition, a period historically situated in the 1st century AD. However, any changes in animal bone patterns must include evidence from a much wider frame of reference, largely because long-term changes could be mistaken for ones seemingly affected by the transition itself. With this in mind I have collected animal bone data from a range of sites from the middle Iron Age to the late Roman period, a period spanning approximately 800 years. In terms of phasing, animal bone assemblages are commonly reliant on the presence of datable artefacts within contexts. Consequentially, the dating of different assemblages tends to align along an inconsistent time-frame and a degree of overlap is unavoidable. I take the view that because time is fluid, and archaeological phasing is imposed from the present, we are constantly observing temporal trends in human-animal relationships when analysing zooarchaeological data, even within single phases. The chronological organisation of the site dating used in this analysis is provided in Table 2; the absolute dating of each assemblage derives from the interpretations of each excavator.

Meso-Scale Phase	Macro-Scale Assemblage Phasing	Approximate Date Range	No. Assemblages (macro-scale only)
One	Middle Iron Age	*c.*400 - 100BC	40
Two	Late Iron Age	*c.*200BC - AD50	69
Two	Transitional	*c.*50BC - AD100	46
Three	Early Roman	*c.*AD40 - 250	135
Four	Late Roman	*c.*AD150 - 400	127

Table 2; Chronological structure of site phasing

Approaching the data at the macro-level requires sites to be categorised by type. Whilst this is essential for standardising a large quantity of data to make it intercomparable, a number of problems exist and need to be considered here. Terms such as 'villa' mask the great range in housing styles which existed in Britain during the Roman period (Hingley 1989; Smith 1993). Fishbourne Palace is certainly not comparable to any other villa in Britain. Villas also tend to be separated from non-villa rural sites (*cf.* King 1984; 1999a), yet many of these sites functioned in very similar ways as productive farms and so exhibit close associations. For wider overviews I have used the category 'rural-minor' sites to include all farmsteads and villas due to the difficulty in separating these on the basis of function. However, when examining the issue of status, sites of obvious wealth will be separated from 'low-status' farmsteads.

Nucleated sites also provide numerous problems in characterisation. In Roman Britain there were towns of different types and separately identified in the Roman world as *civitas capitals* (Chichester, Silchester, Wroxeter, etc.), *coloniae* (Colchester, Lincoln, York, etc.), and *municipia* (St Albans). These were clearly different to Iron Age hillforts, though more similar to the late Iron Age oppida, which have been argued by some to be 'proto-urban' (Collis 1984). Some oppida, such as Silchester in Hampshire, later developed into towns whilst others, such as Stanwick in Yorkshire, never fully developed in this sense. All these sites may be grouped together as 'central places', though again we must remember the range of people and settlements which these places encompassed. A category of 'central place' is also problematic for another group of sites which exhibit both 'rural' and 'urban' characteristics in Roman Britain: small towns, roadside settlements, and *vici*. Modern specialists struggle with the categorisation of such sites, some viewing them as 'secondary urban' (*cf.* Mackinnon 2004), whilst others preferring to highlight their rural characteristics (*cf.* Van der Veen 2008).

One problem with site categorisation is that these labels are conferred from the present and rarely take any account of the perceptions of people who lived in such spaces. It is difficult to know how contemporary dwellers of Iron Age settlements for example, perceived themselves in terms of their own living space. In modern Andalusia, the term 'Urban' can refer to both a cuidad (city) and a pueblo (small town or village); in these cases, urbanity is a matter of density of settlement rather than the size of the settlement (Corbin and Corbin 1987, 22). This concurs with Hingley's (1997, 91) view that small towns in Britain were just a particular form of Romano-British urbanism, particularly as the term 'small town' seems to be a misnomer as many of these settlements were actually larger than some of the towns of true urban status. However, there are, and probably were, different perspectives. In Andalusia, whilst pueblo-dwellers consider themselves to be 'urban', that is, very distinct from country-dwellers whose lives they view as 'slow, primitive and unclean', the people who live in cuidad, at the same time, perceive pueblo-dwellers as 'rural' (Driessen 1981, 53). In this respect I have formed a new category which accounts for these issues: 'rural-nucleated'. Here, small towns and vici are separated from towns, which are 'urban' sites to highlight their status in 'Roman' ideology. Hillforts and oppida, of the late Iron Age, also fit the category 'rural-nucleated' although their associations with urban sites will also be considered.

Clearly a flexible approach to site categories is needed which takes greater account of the data in regards to site nuances such as status and density. Because of this, both site groupings imposed by myself and the original site-type categories given by the excavators will be employed when dealing with different issues. The site groupings employed in this thesis are displayed in Table 3 below.

SITE GROUP	SITE-TYPE
Rural-minor	farmstead, villa, enclosure, industrial
Rural-nucleated	small town, hillfort, oppidum, village, roadside settlement, vici
Urban	colonia, municipium, civitas capital
Military	legionary fortress, auxiliary fort
Religious	temple, shrine

Table 3; Breakdown of site types used in thesis.

1.3 Chapter Outline

The chapter outline reflects the overall aims of the project by dealing with specific, though inter-related themes which are intended to draw the zooarchaeological data from these nested scales in order to examine issues of cultural landscape and identity over the Iron Age/Romano-British transition. Chapter 2 sets out the methods employed in the analysis of the data. Traditional zooarchaeological techniques are used in this thesis but are employed with a new theoretical slant. When the archaeological importance of animal bone was first recognised, they were analysed by zoologists or veterinarians who produced species lists so that the excavators could gain information about the environment of the site (*cf.* Haglund-Calley and Cornwall 1963; Cram 1973; 1978). Whilst environmental reconstructions are generally no longer sought after in modern zooarchaeology, my research is taking this paradigm full circle by returning to the importance of environmental study within archaeology. Instead of viewing sites against an 'ecological background' I see landscape and environment as indivisible from past societies. In Chapter 2 I aim to show that with a small shift in thinking about the ways we examine faunal remains a wider perspective of human-animal relationships can be gained.

In Chapter 3 I will present the analysis of the primary data from Fishbourne with comparisons between this and the other hinterland sites outlined in Chapter 1.1.2. This will be displayed in a traditional style and will look to examine the types of animals present at different sites, how they are reared, managed and distributed, and whether there are changes through time. The aim of this chapter is to produce a detailed set of reliable results which can then be taken forward into subsequent chapters. These results, in effect, become a 'method' by which the main themes of the thesis can expand into new areas of analysis which deal with wider landscape issues.

Chapter 4 examines the theme of 'landscapes of dwelling'. The chapter begins by taking the data presented in Chapter 3 and developing it at a contextual level by analysing on-site spatial patterning of bones. This is done with the intention of understanding the life-cycles of human-animal relationships. Settlements may be structured according to the activities which take place in different areas of the site (*cf.* Hill 1995). Within such locales, the repetitive cycles of human-animal relationships are not simply economic ventures but are imbued with important sensory phenomena. The practices of birthing, rearing, killing, dismembering, distributing and disposing of animals each have specific cultural meanings. They are inter-linked on a temporal basis, but also in a spatial dimension. One aim of this chapter is to draw out the experiential qualities involved in each part of the cycle. In order to provide contextualisation to these, the zooarchaeological data need to be integrated with historical information (Wilson 1996, 86-87; Thomas 2006), other forms of archaeology and theoretically-informed approaches (Maltby 1985, 66-67; see also papers in Maltby 2006). By synthesising data with other forms of evidence, these activities can be examined more specifically to reveal how humans and animals worked together to create landscape on individual settlements. In this way, the animal bone data can be more informative about human-animal-landscape relationships. Rather than simply viewing space in a two-dimensional manner, understanding human experiences of the animal world greatly enhances our interpretation of the local landscape, that of the 'domestic realm', through audio and visual perspectives.

Chapter 5 expands on Chapter 4 by moving from 'site-based' to 'regional' perspectives. Essentially this chapter 'moves out' from the local places of habitation to wider landscapes. It deals primarily with animal bone data from the three (/four) main domesticates - cattle, sheep/goats, and pigs - but looks closer at spatial patterning over wider areas. The chapter begins with a critique of traditional approaches to regionality, arguing that these tend to examine archaeological evidence within recently defined boundaries. My approach employs a bottom-up approach to quantification and ageing data, including the use of GIS mapping, to view patterns of animal management which take greater account of topography and orientation. Differences in social practice can form boundaries through the way humans engage with animals and their environment, and this chapter is intended to pay closer attention to these factors. This analysis, I will show, enables greater understanding the ways people and animals travel around their landscapes. This theme then leads directly into Chapter 6 which focuses upon the role of animals and landscape within the cosmological concepts of 'Nature' and 'Religion'. Continuing the theme of 'travel', this chapter begins by examining the role of horses in Iron Age and Roman society. Horsepower would have been an important method of travelling at speed, and the role of horses as mediators between time and space is examined in detail through zooarchaeological, artistic, and anthropological evidence. Travelling between different spaces can invoke notions of the wilderness and divine spaces and, indeed, the hunting of animals by farming societies has been traditionally linked to land ownership and power relations (*cf.* papers in Kent 1989) – acts which can involve a number of different creatures. The chapter ends with a review of the evidence for the exploitation of wild animals in both periods, with a discussion of how hunting practices might have formed different types of landscape. This aspect moves the thesis into Chapter 7 and the final theme for discussion: Imperial Landscapes.

Chapter 7 uses the full range of evidence to look at the impact of Imperial rule on Romano-British landscapes. Picking up on the theme of travel once more, the imposition of roads in the province was a powerful statement of Imperial control, influencing the ways people moved through the world. This chapter focuses on the emotive experiences which came along with this change including the role of animal-artefacts – livestock bells, horseshoes, etc. – which are seen for the first time in Britain after the transition. Along with the re-orientations in movement prescribed by Roman roads, the use of these artefacts in daily movements would have impacted on people's experience of animals and travelling. Methods of social control through the transformation of landscapes by the Roman state are well known through practices such as centuriation. This chapter moves from the impact of the Roman road-system on the Iron Age landscape to other types of localised space which seem to have emerged after the transition: parks, gardens, and amphitheatres. Such places provided new ways to engage and experience animals; many possibly being metaphors for Empire. This chapter seeks to examine such spaces and the animals which frequented them, including a new range of imported fauna, to find the meanings embedded in these landscapes. This then leads to Chapter 8 where the evidence for human-animal-landscape relationships are drawn together to discover what light this thesis has shed on human attitudes towards the natural world and the animal landscapes over this important period. Developing zooarchaeological analyses in a new way will forward research. This chapter is intended to re-examine the validity of 'AD43', and its traditionally associated caveats, to see if new perspectives of the Iron Age/Romano-British transition have been gained.

Chapter 2: Methods

This thesis involves both the detailed analysis of zooarchaeological assemblages collected personally from the Fishbourne region (see Chapter 3) but also a broader analysis of data synthesised from published and grey literature (see Chapter 5). Beyond this it is a work of interdisciplinarity and integration, dealing with zooarchaeology in its broadest sense: not simply the analysis of faunal remains but also the examination of evidence from animal-related objects, iconography, and ancient history, together with discussion from social anthropology and cultural geography.

It is, however, a zooarchaeological thesis that employs methods and standards created in the 1970s and 1980s and further developments during the past 20 years (*cf.* Grant 1975; 1982; Binford 1981; Grayson 1984; Klein and Cruz-Uribe 1984, Lauwerier 1988; Carter 1998). Whilst techniques such as quantification, ageing and sexing have revolutionised the study of animal bones within wider archaeological research, these were primarily created to understand the productive rather than cultural significance of animals (*cf.* Payne 1973). However, as has been argued in the introduction, animals are not simply economic producers. They have a much wider role to play in the creation and reproduction of culture and cultural landscapes. All the existing methods for dealing with animal bone are perfectly adequate for generating the information required to carry out the research aims of this thesis. Rather than changing existing techniques I hope to show that by taking a small shift in thinking towards zooarchaeological methods we can gain an unfamiliar yet more engaging perspective on past societies. In this chapter I will lay out my methods for analysing animal bones in a way which aims to make zooarchaeology relevant to the study of landscapes and environments of the Iron Age/Romano-British transition.

2.1 Identification

Identification of a bone specimen is the fundamental basis for all zooarchaeological research. Modern faunal analysis is carried out using reference collections or published illustrated material (e.g. Schmidt 1972; Hillson 1996). The quantity of reference material at the disposal of each specialist tends to be as extensive as the resources available at the time, and is generally related to the context in which they are working, whether academic, commercial unit, or freelance. Consequently, the large corpus of data in published and grey literature currently at our disposal varies in identification standards. The identification of a bone, or indeed the misidentification of a bone, can dramatically alter the way we interpret past human-animal-landscape relationships. Most zooarchaeologists impose categories onto the assemblages they examine, 'wild' and 'domestic' in particular. Though whilst we use the Linnaean system of classification as a method for identifying species, the categories of domestic and wild can instead be cultural labels, produced either by linguistic terminology (Asch 1989, 206) or the perception of the environment where the physical engagement between the human and animal takes place (Ingold 2000, 67). The imposition of 'domestic' or 'wild' on an animal bone imbues the specimen with modern ideas about how the animal behaved when alive, what environments it lived in, and the way in which people approached it. Therefore, identification matters.

This is exemplified by the original faunal reports for the 1960s excavations at Fishbourne, which detail the presence of great bustards *Otis tarda* but not the presence of fallow deer *Dama dama* (Grant 1971; Eastham 1971). My re-analyses have shown that the opposite is in fact true for both these species. These single re-identifications have quite dramatic implications for our understanding of landscape form, construction, use and perception, and I will outline these changes here to demonstrate this point whilst, at the same time, explaining my methods of identification.

The avian report from the 1960s excavations detailed seven bone fragments belonging to the great bustard dating from the 1st to 3rd centuries AD (Eastham 1971, 389), an identification which was of great significance because the Fishbourne specimens were the only known remains from Roman Britain and, as a result, have been cited in both archaeological and ecological literature (Parker 1988, 214; Yalden 2002, 417). During reanalysis of the assemblage, four avian humeri (specimens 2047, 5186, 5188 and 6850; see Table 1) were found with existing labels reading 'Otis tarda'. Additionally, four further humeral fragments (specimens 4578, 4579, 5187 and 7536; Table 1) of similar size and morphology to the four labelled specimens were also present. Along with these fragments, a proximal tarsometatarsus (specimen 1258; Table 1) of 'large-bird' size was recognised and removed from the collections for further analysis. No tarsometatarsal fragments were identified by Eastham (*ibid.*) as great bustard and none of the specimens detailed in Table 4 can be directly related to any of the identifications published by Eastham (*ibid.*) due to the absence of original specimen numbers or specific context referencing. The specimens were taken to both the English Heritage Centre for Archaeology, Fort Cumberland, and the Natural History Museum in Tring, Hertfordshire, for comparative analysis with modern ornithological collections. Reference specimens used in comparative analysis included great bustard, common crane *Grus grus*, grey heron *Ardea cinerea*, mute swan *Cygnus olor* and greylag goose *Anser anser*. All fragments were measured where possible according to the criteria of Cohen and Serjeantson (1996) to see whether biometric analysis could be used to differentiate between species; these metrical data are presented in Table 5. Beyond these particular specimens I also used these reference collections with many other identifications for my analysis of the Fishbourne assemblages in general.

Using both metric and visual criteria on the 'large bird' specimens (see Figure 5 for one of the non-metric diagnostics), it became apparent that the purported 'Otis tarda' specimens did not exhibit the anatomical characteristics of the great bustard reference specimens, or indeed those of the grey heron, greylag goose, and mute swan also used in comparative analysis. On the basis of the morphological evidence, alongside the metrical data, it became clear that all nine Fishbourne specimens were in fact common crane *Grus grus*. It is possible that the eight humeral fragments make up the seven specimens originally identified as great bustard by Eastham (1971) as specimens 4578 and 4579 included modern breaks and could have fragmented from each other since original analysis took place.

Specimen	Element	Fragment	Side	Completeness	Butchery?	Context	Date
1258	Tarsometatarsus	proximal	R	25%	no	Room occ.	AD140-180
2047	Humerus	diaphysis	L	50%	yes	Gully	AD43-45
4578	Humerus	proximal	R	25%	no	Floor makeup	AD45-75
4579	Humerus	distal	R	50%	yes	Floor makeup	AD45-75
5186	Humerus	distal	L	75%	yes	Room occ.	AD45-75
5187	Humerus	proximal	L	25%	no	Room occ.	AD45-75
5188	Humerus	distal	L	75%	no	Room occ.	AD45-75
6850	Humerus	diaphysis	R	50%	yes	Courtyard refuse	AD140-180
7536	Humerus	diaphysis	L	25%	yes	Room occ.	AD80-100

Table 4; Summary of 'large bird' specimens from Fishbourne Roman Palace (FB60–68). Notes: specimen number relates to the author's database for the site faunal remains

Specimen	Element	Breadth of proximal end (mm)	Smallest breadth of corpus (mm)	Breadth of distal end (mm)
1258	Tarsometatarsus	24.9	-	-
2047	Humerus	-	17.2	-
5186	Humerus	-	17.1	35.0
5188	Humerus	-	17.3	-
6850	Humerus	-	17.1	-
7536	Humerus	-	17.0	-

Table 5; Measurements (after Cohen and Serjeantson 1996) for common crane bones from Fishbourne Roman Palace (FB60–68)

As well as the labelled bones, comparative analysis of the nine specimens discussed here demonstrated that all derived from common crane. In one re-identification the entire evidence for great bustards residing in Roman Britain has disappeared, altering the natural history of this bird (in fact this was the only osteological record of great bustard in Britain between the end of the last Ice Age and the late medieval period – see Allen 2009).

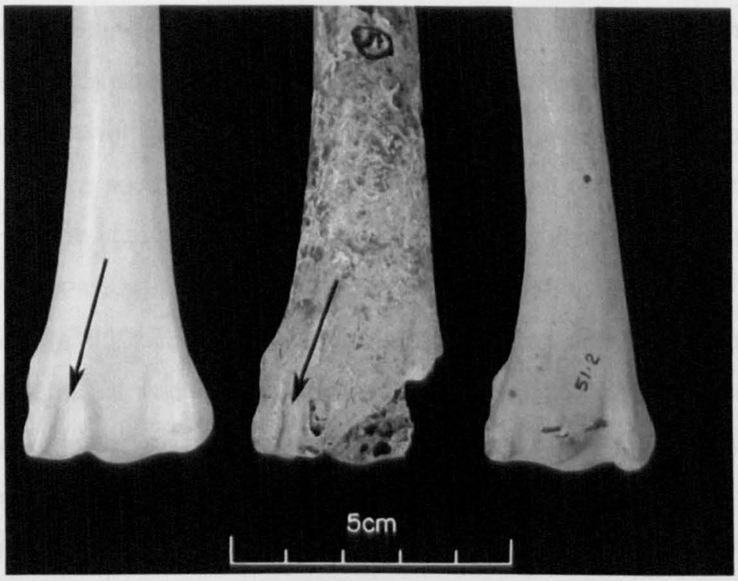


Figure 5; Distal humeri - left: Grus grus (Natural History Museum reference specimen); middle: Grus grus (Fishbourne specimen 5188); right: Otis tarda (NHM reference specimen). Arrows indicate the Sulcus scapulotricipitalis – see Allen 2009 for details

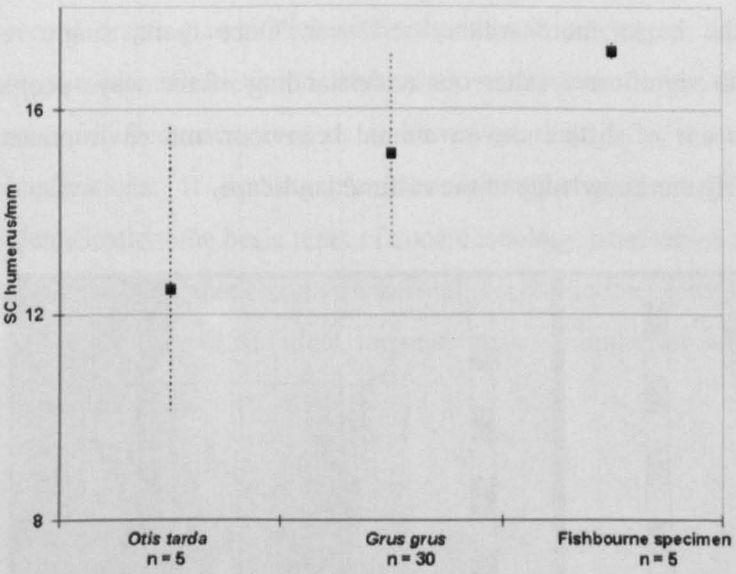


Figure 6; Range and mean measurements for the smallest breadth of the humeral corpus from common cranes (taken from Stewart 2007, 78), great bustards (collected from Natural History reference specimens) and the Fishbourne specimens (Table 5). Note: crane and bustard measurements are from specimens of both sexes and the raw comparative data are comprehensively displayed in Allen 2009.

So what impact does this have for our understanding of the cultural landscape surrounding Fishbourne? Great bustards and common cranes reside in entirely different habitats: the former inhabit open grassland and arable farmland almost exclusively (Lane *et al.* 2001); whereas, common cranes are primarily wetland birds preferring to nest in flat areas close to water. This type of environment was certainly available close to Fishbourne with its associated harbours. The re-identification of the specimens completely alters our understanding of the ways Fishbourne inhabitants moved through their landscape. Rather than travelling north to the downland to hunt bustards, they were wildfowling for crane in the wetlands, areas immediately adjacent to the settlement. These must have been two very different experiences.

The presence of fallow deer specimens were originally reported by Sykes *et al.* (2006a) who discovered two mandibles in an assessment of the remains. My research has now highlighted the presence of many more fallow deer specimens which are comprehensively detailed in Chapter 3 (though see Figure 7). Being a non-native species, Sykes *et al.* (*ibid.*) argued that the fallow deer were imported to Fishbourne from the continent as a herd, and interred in a park around the Palace. It is possible that many of these specimens were originally identified as red deer *Cervus elaphus* which are normally solitary animals, hunted over large ranges of open woodland. The visual aspect of fallow deer is quite striking with their spotted fur and palmate antlers and, being herded in parks, would have provided a remarkably different perspective to sightings of the larger more solitary red deer. Once more, single re-identifications are beginning to significantly alter our understanding of the ways people approached these animals because of differences in animal behaviour and environment; points which significantly modify our knowledge of the cultural landscape.

Figure 7; Left – Fallow deer *Dama dama* metacarpal (proximal end shown here), specimen 2393, to the right of a modern *Dama* reference specimen. Right – Fallow deer *Dama dama* distal radius (unfused), specimen 598, to the left of a modern *Dama* reference specimen (also unfused).

The introduction of new species into regions has implications beyond the effects on local ecosystems. Animal introductions have a meaningful significance for the people who come into contact with them. Indeed there are a number of animals which are likely to have been introduced to Britain during the Iron Age and Roman period, many of which we would find as mundane today, such as domestic fowl and black rats (Poole 2010; Reilly 2010). Imported animals, whether intentional or not, must have, at their inception, been regarded as alien and possibly exotic – a common perception of things deriving from 'outside' realms or places (Helms 1993).

So the identification of animal remains, right down to the species level, is important. My work at Fishbourne Palace Museum included the analysis of a number of assemblages from Iron Age and Roman sites in the region. These were undertaken to standardise much of the zooarchaeological data collected. I used my own reference collection when working on these assemblages though, as mentioned, I also made use of more extensive collections available at English Heritage's Centre for Archaeology at Fort Cumberland and the outstanding avian collection housed at the Natural History Museum in Tring.

More problematic, however, has been dealing with data from published reports and drawing in information gathered by many zooarchaeologists from across the country. Sometimes abnormal identifications of species and their quantities can be found in the archaeological record, creating anomalies within the normalised patterns. In my data synthesis I have relied on the identifications of others and we have to expect that observer error occurs with recurring frequency, even in our own work, though, as shown, these may have considerable implications. If nothing else the examples given here reinforce the importance of identification, the basic tenet of zooarchaeology from which all further methodologies begin. I hope to show that the environmental reconstruction aspect of zooarchaeological research is still important and is, in fact, imperative for our understanding of cultural landscapes.

2.2 Quantification

After identification comes the need to generate 'numbers' from those fragments. Zooarchaeologists have always desired to know how representative animal species are by their remains. There are numerous techniques of quantification which have been developed, from simple counting and weighing to more complex systems of calculating the most commonly occurring element (*cf.* Lyman 2008). In this thesis the analysis of both NISP (number of identified specimens) and MNI (minimum number of individuals) is employed in the analysis of quantification data.

I use NISP data in a number of ways. First the remains from sites at Fishbourne are displayed in a simple count of fragments by taxa to provide the results of my analyses in their most accessible form. Secondly, NISP data are used to calculate relative frequencies of animals, a method which does not provide information about how many animals were on site but becomes valuable for understanding how common different taxa were compared to others. This method can be used to look at animals on single sites, comparing different sites on an individual basis, as well as calculating combined NISP frequencies across a range of sites. For single site analyses the total quantities of fragments under examination are added together from which the percentage of each taxon can be calculated. For calculating relative frequencies across a range of sites (for example, cattle, sheep/goat and pig from all the late Iron Age rural-nucleated sites) all the NISP quantities by taxa are added together from each individual site to form a total. This total is then divided by the number of sites to give a mean result for each taxon. This is calculated to mitigate the results from any particularly large sample which might skew the results. Similarly, any sites with a total sample size of less than 100 are removed from the calculations. The mean quantities of fragments are then used in the same way that absolute quantities for each taxa from single sites are calculated to give relative frequencies, as detailed above. This final calculation is essential because the total of the mean quantities will not necessarily total 100. This method can then be used for a range of chronological periods or site types to compare patterns between each. When quantifying remains of other mammals and birds I have calculated their percentages against the corresponding quantity of cattle and sheep/goat remains from the same site to keep the data standardised. Once calculated, these percentages are then divided by the number of sites in the given sample, which may be all sites in a given phase or a group of sites of a particular type within a phase.

Fish are often recorded in reports by presence/absence rather than absolute quantities and to maintain compatibility I adopt this method. To analyse fish quantifications I have displayed the percentage presence of fish by site and species diversity calculations. I calculated the percentage of fish and fish species presence by time and by site-type. The total number of assemblages with fish present is divided by the total number of assemblages in any given group and this number is then multiplied by 100 to give a percentage presence result. The fish taxa frequency is calculated by finding the mean quantity of individual fish species which occurred by phase or site-type. More precisely, the number of sites with fish remains was counted, and divided by the number of taxa present in the phase in question. The results can then be compared by phase to give a proxy measure of species diversity.

Body part patterns are also an important method of quantifying animal bone by skeletal element. The final method of quantification used in thesis is MNI calculations to provide results for body part analyses. These have only been used for the analysis of Fishbourne, though I do refer to the results from other sites by different specialists. Body part representations are calculated using Serjeantson's (1996) 'zones' system where each specimen is recorded according the part of the bone represented. For example, a femur or thigh bone can be divided, theoretically, into 8 parts or 'zones'. The left and right parts of the proximal epiphysis (the articulating surface at the 'upper' end of the bone) are zones 1 and 2 respectively, then the left and right sides of the top half of the diaphysis (the shaft of the bone) are zones 3 and 4 respectively, and so on to the opposite end of the bone. By recording the zone/s present on each specimen, and the side of the body represented, the absolute number of each skeletal element can be calculated. This provides a more accurate quantity relating to actual numbers of animals rather than simply a number of fragments. Once the total MNI has been calculated for each element of the skeleton, the quantities are divided by the MNI of the most commonly occurring element, and then multiplied by 100 to give a %MNI for each. For example, if there are cattle left mandibles representing 10 individuals (and is the greatest occurring element) and cattle right femurs representing 5 individuals, the %MNI of the mandible would be 100% (=[10/10]*100), and the %MNI of the femur would be 50% (=[5/10]*100). Each element can then be compared directly to each other giving a relative frequency for each skeletal element by taxa occurring on a given site. This method is particularly useful as it mitigates the problems of differential preservation and fragmentation between each element. I have not used this method for examining patterns across a range of sites due to the difficulties in standardising the variety of methods which have been used for dealing with body part patterns, such as the 'epiphysis' method (Grant 1971), or counts of 'body areas' such as 'head', 'upper forelimbs' and 'extremities' (O'Connor 1988; Noddle 2000). Such diversity makes this method unsuitable for calculating relative frequencies from multiple sites.

Of course, the techniques detailed above are 'traditional' in their methodology for quantifying animal bone samples. As already stated, my research employs them in a slightly different theoretical fashion. The common assumption from quantification results is the idea that the better represented an animal is, the more important it was. I would argue that this view inherently restricts the ways in which quantification informs us on the value of animals in past societies. When placed within a purely economic context, taxa frequencies provide information on livestock ratios and dietary contribution but lack the potential for insights into the social importance of animals. When integrated with ethnographic and historical work this provides them with a wider context and can suggest how human-animal relationships were more than just an economic concern but forms of social connection between people and their livestock. Cattle, sheep and pigs are, commonly, the best represented species on British sites of Iron Age and Roman date. As in other societies today these animals would have formed social bonds with those people who they lived with every day (*cf.* Abbink 2003; Ivarsdottir 2004), a point which is seldom considered by zooarchaeologists. Less frequently occurring species, such as horses and dogs, are not given the same attention as cattle, sheep and pigs by zooarchaeologists who, attribute them with much less value, again assuming that this was true of people in the past.

However, whilst people farm livestock they also engage with other animals on a daily basis, whether hearing bird song, seeing fish swim upriver, stroking dogs, or riding horses, each exchange has a specific cultural meaning. Such interactions give quality to the world through texture, sound, and colour, thus generating space, time and structure to landscape (see papers in Wilkie and Inglis 2004). By quantifying animal remains we get a good sense of which animals were physically engaged with by different people and to what degree. Rarer human-animal connections may have had even greater social meaning for people compared to the 'routine' rearing of livestock. Red deer remains, for example, are recovered on sites in minimal proportions compared to cattle, sheep and pigs, yet historical evidence shows that the medieval deer hunt entailed a highly ritualised process (Sykes 2006, 70-76). The elaborate methods involved with chasing and capturing such an animal entails highly emotive responses, linking people to the surrounding landscape whilst generating powerful cultural ideals (*cf.* Hamilakis 2003). In terms of social importance rather than purely economic perspectives, animal bone quantities and skeletal representation may be analysed from a 'bottom-up' perspective reversing our notions of *value*.

2.3 Ageing

Techniques for ageing animal remains developed to gain ideas about herd management on settlements and have been employed to increase the understanding of past economies (*cf.* Silver 1970; Getty 1975; Grant 1975; 1982). Payne's (1973) work, in particular, was instrumental in forwarding methods of analysis which aimed to pick out differences in husbandry styles from varying ageing results, arguing that evidence of greater frequencies of infant culling in caprine populations could be viewed as an attempt to increase the production of animal products.

For the Fishbourne assemblages I recorded both dental ageing and epiphyseal fusion data. Mandibular tooth eruption and wear patterns were collected for sheep/goats, cattle and pigs using Grant's (1982) methodology. Dental ages were recorded on mandibles where two or more 'recordable teeth' (deciduous or permanent forth premolar, and the first, second and third permanent molar where present). Age stages from A to J (not including 'I' because of its similarity with '1') were then assigned to each specimen, again following Grant's (1975) wear stage definition. However, in order to adopt the most up-to-date techniques I integrated

Grant's (*ibid.*) methods with absolute ages from recent work on live sheep/goats and cattle by Jones (2006; pers. com.). These absolute ages are given in Table 6. As well as Fishbourne assemblages I returned to the large Iron Age and Romano-British assemblages from the Cattlemarket site at Chichester, Copse Farm, North Bersted, Lavant, Carne's Seat, and Elstead, where I have reanalysed all cattle, sheep/goat and pig mandibles for ageing data to keep my analyses standardised between these locally important sites.

Epiphyseal fusion was recorded for the Fishbourne assemblage using the data produced by Silver (1970). This method is based upon the ages at which the epiphyses fuse to the main parts of the bones once full growth has been reached. Age ranges for foetal and neonatal domesticates have been based upon the methods of Prummel (1987). Ageing by bone development is less accurate than dental analysis as it can only show that an animal is younger or older than a specific age, that at which the particular element fuses. It can, however, provide relatively detailed age profiles on single sites when large sample sizes are present. Unfortunately, the epiphyseal fusion method for gauging age profiles is prone to different reporting styles across bone reports and therefore this method is unsuitable for analysis beyond the individual site level.

The recording of dental ageing is also prone to inter-worker differences; however, results from other reports can be formulated to coincide on a standard basis (e.g. Hambleton 1999; Sykes 2007c). For this, I have based my work on Hambleton's methodology (1999, 64-7) for converting the results of different analyses of mandibular tooth wear into a similar format (Table 6). This will be employed to deal with the different ways in which bone specialists record and interpret dental wear by correlating analyses that have used a range of different methods. In addition, I have developed Hambleton's (1999, 64-7) methodology further by introducing Jones' (2006; pers. com.) recent work with live populations of sheep and cattle to get a more accurate idea of absolute ages. I have assigned new estimated ages to Payne's original age stages (A-J). These ages take into account Jones' (2006, 177) 'majority of records' based on the central two-thirds of sheep tooth wear data. The conversion of Grant mandible wear stages (MWS) to Payne's wear stages are also updated from Hambleton's (1999, 65) results to coincide with Jones' (2006, 161-3) data for between age stages D and H. Live sheep data are, unfortunately, unavailable prior to Grant MWS 24 as it is impossible to see 1C, 2V and 3E (crypt, visible, alveolar eruption) stages as these are obscured by the gum (Jones pers. com.). Data are also unavailable after Grant MWS 45 as sheep living on most modern hill farms do not survive much past 7 years of age (Jones 2006, 169).

The 'Approximate Age' boundaries are maintained without overlap for each age stage to create standardised age-at-death profiles (Table 6). It must be remembered that there will be a small degree of error where samples could be assigned too young and others too old. For example, Jones (pers. com.) noted that some early E stage sheep were actually less than 2 years of age during the winter months. For an indication of level of error, refer to Jones (2006, 177, figure 17). There is also evidence that the teeth from some archaeological specimens of sheep wore faster than those of modern breeds (Jones 2006, 167). However, the introduction of this research into my wider synthesis of data has provided the opportunity to look at age patterns from a range of sites on both the macro- and meso-scales more accurately. For these analyses I have taken mandible wear stages in absolute numbers of specimens, calculated the percentage of this number by site then worked out the mean percentage for all sites by phase and region. These make the data directly comparable across wider landscapes.

Table 6; Dental wear stage conversion formats for sheep, cattle and pig (based on Hambleton 1999, 64-67; updated after Jones 2006; pers. com.). Note that the 'Age Stage' given here are the ones used in this thesis, and not necessarily relating to the work of other zooarchaeologists.

- SHEEP -

AGE STAGE	APPROXIMATE AGE	JONES 2006, fig.17 (majority of results)	PAYNE DEFINITION	GRANT DEFINITION	GRANT MWS
A	pre/neonatal	0-1 months	Dp4 unworn	Dp4 </=a	1-2
B	1 – 3 months	1-3 months	Dp4 in wear, M1 unworn	Dp4 >/=b, M1</=a	3-7
C	4 – 12 months	3-12 months	M1 in wear, M2 unworn	M1>/=b, M2</=a	8-18
D	1 – 2 years	10-24 months	M2 in wear, M3 unworn	M2>/=b, M3</=a	19-26
E	2 – 3 years	20-36 months	M3 in wear, post. cusp unworn	M3=b, c, d	27-32
F	3 – 4 years	2.5-4.5 years	M3 post. in wear, M3 pre □□-	M3 e, f	32-35.5
G	4 – 7 years	4-e.9 years	M3 □□-, M2 □□	M3=g, M2=g	36-41
H	7 – 9 years	e.6-e.11+ years	M3 □□-, M2 post □□	M3=g, M2>/=h	42-44
J	9 years +	e.8-e.13+ years	M3 post □□-	M3>/=h	45+

- CATTLE -

AGE STAGE	APPROXIMATE AGE	HAMBLETON AGE	PAYNE DEFINITION	GRANT DEFINITION	GRANT MWS
A	pre/neonatal	0-1 months	Dp4 unworn	Dp4 </=a	1-3
B	1 – 6 months	1-8 months	Dp4 in wear, M1 unworn	Dp4 >/=b, M1</=a	4-6
C	6 – 18 months	8-18 months	M1 in wear, M2 unworn	M1>/=b, M2</=a	7-16
D	18 – 24 months	18-30 months	M2 in wear, M3 unworn	M2>/=b, M3</=a	17-30
E	2 – 3 years	30-36 months	M3 in wear, post. cusp unworn	M3 b-d	31-36
F	3 – 6 years	young adult	M3 post. cusp in wear, M3 < g	M3 e-f	37-40
G	6 – 8 years	adult	M3 = g	M3=g	41-43
H	8 – 12 years	old adult	M3 = h-j	M3 h-j	44-45
J	12 years +	senile	M3 = k+	M3>/=k	46+

- PIG -

AGE STAGE	APPROXIMATE AGE	HAMBLETON AGE	PAYNE DEFINITION	GRANT DEFINITION	GRANT MWS
A	pre/neonatal	0- 2 months	Dp4 unworn	Dp4 </=a	0-1
B	2 – 6 months	2-7 months	Dp4 in wear, M1 unworn	Dp4 >/=b, M1</=a	2-8
C	6 – 12 months	7-14 months	M1 in wear, M2 unworn	M1>/=b, M2</=a	9-17
D	1 – 2 years	14-21 months	M2 in wear, M3 unworn	M2>/=b, M3</=a	18-32
-	-	21-27 months	M3 in wear, post. cusp unworn	M3 b-d	33-42
E	2 – 3 years	27-36 months	M3 post. cusp in wear, M3 <g	M3 e-f	43-46
F	3 years +	adult	M3 = g	M3 = g	46+
-	-	old adult	M3 = h-j	M3 h-j	-
-	-	senile	M3 = k+	M3>/=k	-

These data are traditionally used to focus on the death of animals, a perspective which is fundamental for unlocking information regarding animal economies. However, it could be argued that this also restricts the full potential of what ageing profiles might be informing us about (Sykes in prep.). Data are displayed as 'mortality profiles' so only the final product of livestock rearing is discussed within the literature, such as wool production or cattle dairying. Whilst these are important aspects in our understanding of the past, the economic perspective excludes the greater range of meaningful connections which must have developed between people and those animals whilst alive.

Age profiles of animals reflect as much about the behaviour of people in the past, as they do about economies. The killing of an animal is a single event whereas the birth, rearing and movement of animals take place over longer periods; in many cases some years. Daily interaction would generate many associations between people and livestock with human and animal lives being tied together by mutual experiences and memories (*cf.* Lorimer 2006). In modern pastoral societies people and animals develop close social relationships which are an essential part of human culture and history (Abbink 2003; Ivarsdotter 2002). There is no reason to suspect such bonds were not important to communities in the past (*cf.* Mlekuž 2007). If zooarchaeologists take this notion on board, viewing data as 'age-of-life' rather than 'age-at-death' profiles, then ageing methods can take on a whole new perspective for our analysis of human-animal relationships. It is through daily practices that people create and perceive cultural landscapes (Tilley 1994, 21-24; Ingold 2000). If we accept that the ageing data is a reflection of human behaviour, this will thus provide information about human-animal-landscape relationships. Spatial variations could then suggest the existence of 'regional identities'. Furthermore, the chronological range of the data allows for an examination of any possible affects of the Roman Conquest on those identities. If true, this should be demonstrated within the zooarchaeological data, such as changes to animal husbandry regimes, and from this perspective would provide a more detailed view of the transition.

2.4 Seasonality

Ageing methods based on dental wear provide some information on seasonality, and the subject has received some attention for sites in Britain (*cf.* Legge *et al.* 1992). Advances in ageing have developed particularly with regards to examining seasonality by looking at tooth development in roe deer, red deer, wild boar/'primitive' *Sus* breeds (Carter 1998; 2001a; 2001b; 2006; Carter and Magnell 2007). Analysing tooth development prior to dental maturity is a method which can give very narrow age ranges for individual specimens

(Hillson 2005, 210-211). When considering the large quantity of caprine mandibles from sites in the Fishbourne region of Iron Age and Roman date, I felt that the opportunity existed to develop a method for examining sheep ages by radiographing the mandibles of sheep of known ages-at-death to identify stages of tooth development inside the mandible. To carry this out I used the extensive modern collection of sheep mandibles from individuals of known age housed by English Heritage at Fort Cumberland (Baker *et al.* 2006). By x-raying sheep mandibles, tooth development stages were ascertained (Table 7), based upon systems previously developed for ageing red and roe deer specimens (Brown and Chapman 1991b; Carter 1997; 1998; 2006), which can be related to the absolute ages of the animal (Stages for *Sus scrofa* are slightly different and can be viewed in Carter and Magnell 2007). The primary purpose of the scheme is that it can be applied to archaeological material providing ageing data of increased accuracy compared to current methods for past sheep populations.

Stage and Score		Description
Deciduous	Permanent	
(7)	-	Half root length formed
(8)	-	Late root formation
(9)	-	Full root length (apex open)
(10)	-	Full root length (apex closed)
-	1	Evidence of a crypt
-	2	Evidence of mineralisation
-	3	All cusps mineralising
-	4	Infundibulum formation
-	5	Crown formation complete
-	6	Early root formation
-	7	Half root formation
-	8	Late root formation
-	9	Full root length (apex open)
-	10	Full root length (apex closed)

Table 7; Stages of tooth development employed for analysing sheep (Also used for roe deer by Carter 2006, 46; after Brown and Chapman 1991a).

Once achieved the scoring system was applied to archaeological specimens. Development of molariform teeth (Deciduous: dP2, dP3, dP4. Permanent: P2, P3, P4, M1, M2, M3) was examined where possible. Specimens were radiographed in a Faxitron Cabinet X-ray System housed at Fishbourne Roman Palace Museum. For standardisation, the left side of the mandible was radiographed except where the left side was missing or damaged more so than the right. AGFA Structurix D4 X-ray film (18 x 24cm) was placed inside a holding cartridge upon which the mandibles are placed buccal side up. The buccal side was radiographed as the roots on this side tend to be shorter than on the lingual side and, therefore, complete formation slightly earlier. The holding cartridge was placed 60cm away from the x-ray source. The time of exposure, voltage and amperage settings are specifically set for different species at different ages to allow for variations in bone thickness. These are set as follows:

Species	Sample type (age of specimen)	Exposure time (sec)	Amperage (mA)	Power (kV)
Sheep	0-12months	60	3	60
	>12months	70	3	60
Pig	0-12months	90	3	60
	>12months	100	3	65
Roe deer	0-12months	60	3	60
	>12months	70	3	60
Red deer	0-12months	60	3	60
	>12months	80	3	65

Table 8; Radiography settings used in the examination of sheep, pig, roe deer and red deer mandibles.

Once the mandible has been radiographed and development stages have been assigned to each tooth, a tooth score was calculated and the data for specimens plotted by age (months). The ageing tables for sheep, pigs, roe deer and red deer are given in the appendix. The columns in the charts represent the tooth development stage and the rows represent the absolute age of the specimen. Each sequence of numbers found in the squares, i.e. 2-0-2, signifies two things. First, the position of the number in the sequence relate to a particular tooth type; in this case either P4-P3-P2, or (dP4-dP3-dP2) if in parentheses. Second, the value of the number signifies the quantity of teeth which are scored according to corresponding stage of development and age.

Site	Caprine	Sheep	Goat	Pig	Red deer	Roe deer	Grand Total
Fishbourne (FB61-68)	112		1	54	5	15	187
Fishbourne (FB82-83)	4	2					6
Fishbourne (FB92)				5			5
Fishbourne (FBE95-02)	22	1	1	17	1		42
Fishbourne (FBA95)				1			1
Fishbourne (FB98)				1			1
Chichester Cattlemarket	196	5		51		1	253
Oving	16	8		1			25
Elstead	16	1					17
North Bersted	9	1					10
Batten Hanger	6	2					8
Carne's Seat	3			1			4
Lavant	5	3					8
Grand Total	389	23	2	131	6	16	567

Table 9; Count of mandible specimens used in radiograph analysis by site and by species.

Using this new methodology, including existing systems developed for *Sus scrofa*, *Capreolus capreolus*, and *Cervus elaphus*, I analysed archaeological samples from sites in the Fishbourne region to examine from sheep (Fishbourne, Chichester Cattlemarket, Carne's Seat, North Bersted, Copse Farm, Lavant, Elsted, Batten Hanger), pigs (Fishbourne, Chichester Cattlemarket, Carne's Seat, Copse Farm), roe deer (Fishbourne) and red deer

(Fishbourne). The specimen sample sizes are given by site and by species in Table 9. An example of a radiographed pig mandible from Fishbourne with dentition at different stages of development is shown in Figure 8.

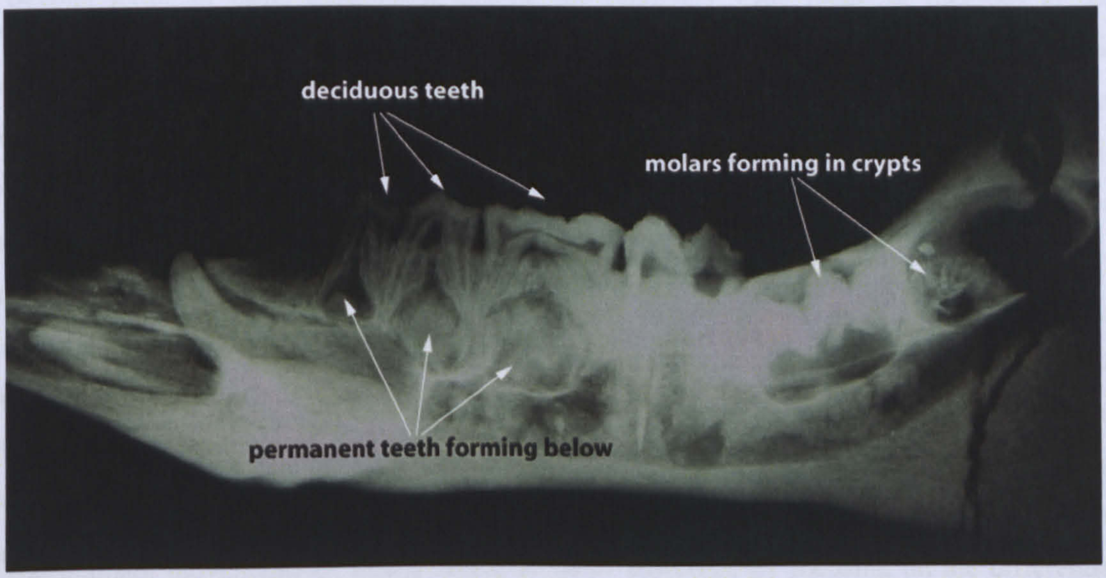


Figure 8; Radiograph of pig mandible (specimen 4547) from Fishbourne Roman Palace, AD43-75. Specimen has an estimated age-at-death of 5-6 months

Examining seasonality in populations of domestic and wild animals importantly gives us more information than simply economic issues. Seasonality can tells us about the ways animals were involved in human practices which revolve around human concepts of time. Time is not an abstract entity but a quality of human engagement with the world (Gosden 1994, 1). The birthing, rearing, and slaughtering or hunting of animals would have been integral to human concepts of time in past societies.

2.5 Metrics

Biometric analysis is not obviously linked to the study of landscape. The primary reason for measuring bones of animals has been to separate types of animals from the same or very similar species, such as male/female, domestic/wild, or between different breeds. The identification of a 'wild' animal which has common cousins is a difficult exercise within zooarchaeology. As argued in Chapter 2.1, the ability to separate wolves (Pluskowski 2006), cats (O'Connor 2007), and boars (Albarella and Payne 2005) from domesticated populations will have significant effects on the interpretation of an assemblage, particularly in regards to landscape and environment. Additionally, livestock breeds are recognised to be as important visually within local environments as much as they are bred for economic concerns (Yarwood and Evans 1995).

Albarella *et al.* (2008) have shown that considerable shifts in animal sizes took place around the time of the Roman Conquest in Essex. This has been put down to either specialist breeding, importing of continental stock, or a combination of the two. Whatever the case, the size change represents the existence of a different 'type' of cattle to the common native 'celtic shorthorn' which has traditionally been referred to in the zooarchaeological literature (Jewell 1963; Reynolds 1985). The concept of a breed is a modern one and, today, breeds of cattle, sheep, goats, and pigs are associated with different types of landscape (Yarwood and Evans 1995). These examples propose livestock as symbolic of different environments and maybe inapplicable to the study of Iron Age and Roman Britain. Different 'breeds', in an ancient sense, however, could be applicable for human-animal relationships in terms of experience. There are indications from ancient Latin authors that 'different types' of domesticates existed in different areas of the Roman Empire. Mackinnon's (2001; 2010) analyses of biometric data from Roman Italy has suggested that selective breeding of livestock was taking place. If there were different 'types' of livestock being bred in Britain, these would have existed as animals which looked and behaved differently to others elsewhere and, in turn, would have been perceived differently by people.

Differences in cattle sizes have other implications for the role of animals in the landscape. The breeding and use of bulls and oxen in traction is linked to widespread changes in the agricultural landscape. It has commonly been assumed that the development of the villa system and the rise of urbanism were interlinked via increasing use of arable land and cultivation of marginal landscapes (see Millet 1990, 91-99). Special attention will be paid to the zooarchaeological evidence for this phenomenon, in particular the indications of changes to cattle metapodia morphology which might indicate greater use of traction animals.

To examine these issues I have personally collected primary biometric data from Fishbourne Roman Palace, Carne's Seat and Lavant, using the standards of Von den Driesch (1976). In addition, extra tooth measurements have been recorded on pig specimens following the methodology employed by Sylvia Warman (Warman 2000, 163-172). This has been carried out to identify the possible existence of different pig populations at Fishbourne Palace. The collection of secondary data has been gathered from the archival reports from Chichester Cattlemarket (Levitan n.d., after 1981) and Copse Farm, Oving (Browne n.d., after 1985), again to gain a greater level of standardisation between the local sites. I have also collected published measurements from a few key publications where the data had been presented in an unaltered fashion for a wider review.

2.6 Sexing

Methods for sexing animal remains are used for highlighting male and female frequencies in livestock herd structures (*cf.* Albarella and Payne 2005), though these data are rarely taken beyond terms of basic description despite the relatively wide range of methods at our disposal, including both metric and non-metric traits (papers in Wilson *et al.* 1982; Davis 1987; Ruscillo 2003; papers in Ruscillo 2006; Sykes and Symmons 2007). The sex of an animal has implications for the ways they are engaged by people, firstly from an economic perspective the role of an animal is obvious, such as the milking of cows or ploughing oxen. On a social level, however, the sex of an animal also relates to the ways they are perceived by people as part of a social group. Wethers, or castrates, tend to be viewed as having particular 'special' roles within herding communities commonly leading other members of the herd as they travel (Lorimer 2006). Mackinnon (2004b) reviewed and integrated sex data with ageing data to examine the economic role of caprines in Roman Italy. Whilst focusing on economic aspects, Mackinnon (*ibid.* 55-57) was able to get a better understanding of transhumant movements of flocks across areas of pasturage by focusing on the differential sex ratios between sites, such as the presence of breeding groups on lowland sites and same sex groups on upland sites. Information such as this provides increased resolution for examining the ways in which animals were being moved through the landscape. It is applicable then that the economic traits which are suggested by sex data can be discussed in wider social terms of human behaviour, the division of labour, and human/animal relationships with the land.

I have recorded sex information from the Fishbourne material on the morphology of the pelvis of sheep/goats and cattle. The morphology of pig canines is used to demarcate sex where a closed root to the tooth indicates a female, whereas an open root is suggestive of a male as the canine continually grows in males (*cf.* Albarella and Payne 2005). In domestic fowl sex can has been determined by the presence of medullary bone on the inside of the femur and tibiotarsus (Driver 1982). The absence of medullary bone does not necessarily indicate a male bird as it is only formed in females prior to laying. The presence of males in domestic fowl is provided by the presence of spurs on tarsometatarsals.

2.7 Butchery

Cut marks are important for looking at the ways in which animals were processed after death and this is reflected by the many zooarchaeological studies which have dealt with the subject (Grant 1989; Maltby 2007; O'Connor 2000; Seetah 2005). Primarily this work has aimed at looking at the rise of the professional butcher and the development of towns. Maltby (2007) and Seetah (2005) in particular have gone to considerable lengths to highlight the changes in butchery techniques associated with the development of the Romano-British town, particularly with regards to new tools and techniques which were employed by butchers in urban areas. Maltby's (2007) excellent summary of butchery data from Iron Age and Romano-British sites demonstrates the different methods of cattle dismemberment which existed between phases and sites. Again interpretations have been based within an economic paradigm and there has been a common assumption that the level and type of butchery relates to the abilities of the butcher. Seetah's (2006) research has suggested that the marks displayed on cattle in Roman towns, far from indicating primitive butchery methods, represent a need to dismember carcasses in a quick and efficient fashion. However, sheep remains in late Roman Lincoln did not exhibit the level and types of butchery taking place on cattle throughout Roman phases (Dobney *et al.* 1996, 28). This indicates that straightforward economic development in animal processing was not universal. There is another factor which has also not been taken into account that being the relationship between the 'butcher' and the animal prior to its death. Anthropological examples have shown how the dismemberment of animals relates directly to the social relationship between the animal and its butcher (Studer and Pillonel 2007; Abbink 2003). In cases where the animal has been reared, known and loved by its people the animal will not be treated like 'meat', as the end product of the process, but as the 'animal', the previous incarnation. In this sense all types of butchery must reflect human-animal relationships and the level of respect accorded to the animal. These are issues beyond simple economic aspects.

With these factors in mind I wish to take a slightly different perspective on the role of butchery in Iron Age and Romano-British contexts. Symons (2002, 442) has argued that animals are not lost through butchery but are allocated through the social distribution of the carcass. Butchery methods were changing at Roman towns, and also at military sites (*cf.* Stallibrass 2000), so the distribution of animal parts was being reallocated along different lines to those previously established. This must represent shifts in community structures: a 'shuffling' of the social order. From here, a link between altering environments and the organisation of society is possible. The development of urban areas went hand-in-hand with social networks, and possibly the distribution of land. Also, the rise of the town could be seen as a separating living space from the countryside. Would such a psychological change affect the social distance between the 'human' as culture, from the 'animal' as nature? Such a shift in worldview would be reflected in zooarchaeological evidence with butchery a primary indicator of approaches to animals. This is the theoretical approach I will take towards butchery evidence, a form of zooarchaeological information not obviously linked to studies of cultural landscape but, I think, viewed from this perspective interpretations could have considerable implications for understanding worldviews which are intimately linked to perceptions of environment and complex social attitudes towards landscape.

I have collected butchery data from the Fishbourne assemblage using the methodology of Lauwerier (1988). To examine the frequency of remains which show evidence of butchery I calculated the percentage of specimens from the main domesticates with marks by phase and by taxa against the assemblage as a whole. I have further calculated the mean frequencies of butchery marks on a given specimen between different taxa. This has been worked out both for the average number of cut-marks of each specimen and also the relative frequency of cut-types by phase for each of the three main domesticates. Finally, I determined the relative frequency of cut-mark types on different parts of the body from cattle, sheep/goat and pig. For this, I quantified the number of specimens which included marks of particular type - cut/shave, chop/saw, fracture - on different elements - femur, humerus, etc. – and then grouped the quantities of different elements into 'body part' categories as detailed in Table 10.

Body Part	Elements
shoulder & neck	mandible, atlas, axis, cervical vertebra, scapula, proximal humerus
torso	thoracic vertebrae, lumbar vertebrae, rib
forelimbs	distal humerus, ulna, radius
hock joints & feet	distal tibia, metapodials, podials, phalanges
rump	pelvis, proximal femur
rear limbs	distal femur, patella, proximal tibia

Table 10; Body part groups for categorising elements in analysis of butchery data.

These groups in no way relate to standard butchery forms but are designed to give an idea of carcass dismemberment. Once collated the relative frequency could be worked out for each group by taxa and by phase. For the analysis of cattle I included 'cow-sized' fragments in order to retrieve the quantity of butchery data from rib and vertebral fragments which make up the elements of the 'torso' body part category. I accept that this may include a proportion of horse remains, though I would argue that the much higher frequency of cattle compared to horse overall in the Fishbourne assemblage would mitigate the effects of a small sample of horse butchery and will yield more beneficial information about cattle butchery patterns compared to that potentially lost if this data is ignored. I have included 'sheep-size' fragments for calculations of the total assemblages but have not included this category in analysis of either sheep/goat or pig samples for mark-type frequencies due to the greater overlap between these species present in the sheep-size category. Because of this, there is no 'torso' body part category for the analysis of sheep/goat or pig specimens. On a wider scale, it is unfortunate that many published reports rarely give detailed information relating to butchery. The lack of standardisation in methods means that it is currently impossible to satisfactorily synthesise butchery mark data from different specialists. I have examined data personally collected which will be viewed against the interpretations of others (e.g. Knight 2002; Maltby 2007). Instead, this research provides me with a wider context within which to situate and question the evidence from Fishbourne Palace.

2.8 Spatial Analysis and Geographic Information Systems

The importance of contextual examination of animal bone has long been recognised (*cf.* Grant 1984; Hill 1995). Maltby (1985) was one of the first zooarchaeologists to demonstrate that distinct patterns in faunal assemblages can be found through their disposal in different types of context, arguing that different features have alternative effects on the preservation of bone of differing size and density, for example, larger animals such as cattle and horses tend to preserve better in ditch deposits, whereas smaller sheep, goat and pig remains are more prominent in pits. Wilson's (1996) work took this a stage further by examining the spatial patterning of bones in relation to their contextual background using late Iron Age farmsteads such as Mingies Ditch, Oxfordshire. Wilson (*ibid.* 16-18) was able to show that by modelling data over a site, an index of activity could be elucidated. Wilson (*ibid.*) argued that activities such as primary butchery took place at the peripheries of the settlement with the associated waste deposited in the outer ditches, with waste from craft activity being deposited closer to the centre of the settlement. King (1985, 282) showed that even finer patterns of faunal variability could be deduced on more complex sites from his analysis of areas including gardens, granaries, and courtyards at the *villa publica* at Settefinestre, nr. Naples. The modelling of faunal data has also employed GIS (Geographic Information Systems), an approach which has become more frequent over the past 20 years, either focusing on single sites (Byerly *et al.* 2005), or examining a range of sites (see Mainland 2008 for a review of the use of GIS in zooarchaeology). Each of these approaches to zooarchaeological data has been instrumental in providing a spatial perspective to the role of animals on archaeological sites, with which to compare or complement the, more traditional, temporal analysis.

In my research I have employed both contextual information for examination of faunal remains at Fishbourne on the micro-scale, and GIS modelling of data from a range of sites on the 'regional' meso-scale analysis. For the Fishbourne assemblages I have detailed records of the contexts from which each bone specimen derived. For each excavation I used the site plans and other archive information to plot the faunal remains in different areas around the site, making it possible to tie together the spatial patterning between different excavations. On this basis the faunal remains can be analysed more precisely using data gained directly from the material (as detailed in methods above). Previous analyses have focused on the bones and their 'final resting place'. This is where my research diverges from the traditional approaches by focusing on human experience of animals rather than seeing them in a detached, economic sense. The behaviour and properties of animals, how they look, sound, smell, and feel, whether as living animals or as 'products' (i.e. skin, meat, bones, fat, artefacts), are important ingredients for human experience. Similarly, human-animal interactions in terms of production, distribution, consumption, and disposal, all structure and give meaning to human (and animal) worlds. Experiencing animals in 'space' will generate meaning and create places and memory. Therefore, by integrating taxa frequencies, ageing data and body part patterns within a spatial format, I aim to examine the way in which the site was structured according to daily practice involving all aspects of human-animal relationships. Beyond single site analyses I have used the GIS software Arcview 3.0 to position quantified faunal data on regional topographic maps. This is the basis for my regional approach where I will integrate quantification data with ageing data from the same sites to understand the role of farming within the wider physical landscape. This is carried out so that the positional relationship between sites is taken into account rather than simple displays of data from different sites which take little account of distance and topography. A full critique of this and previous attempts of the approach is outlined in detail in Chapter 5 prior to analysis, but it is envisioned that this work will follow that of Mackinnon (2004b) in looking at farming practice and herding movements across the landscape.

2.9 Zooarchaeological Reporting

Over the past 30 years, zooarchaeological work, although now accepted as a necessary part of archaeological research, has moved from the centre to the periphery of intellectual interpretation. Today many zooarchaeologists are unable (due to time/budget restrictions) to provide more than simple descriptions of the data yielded by the methods mentioned above. However, I do not accept that descriptions of raw data (e.g. that an assemblage contains 35% cattle, 25% sheep/goat and 40% pig) should constitute the end product of zooarchaeological reporting: as I have outlined above, these data should be the starting point of detailed social interpretation. With this in mind, I view my next chapter on the Fishbourne assemblage as a method in its own right. The data are presented in a traditional format with comparisons to local contemporary sites. The principal reason for doing this is so that my data are accessible and can be used by other researchers who might be able to benefit from them further. Secondly, it should become clear by the end of this thesis how much further such data can be taken within a theoretically-informed approach.

Chapter 3: 'The Faunal Remains'

The discovery of a 'Roman Palace' in 1960 within the small village of Fishbourne in West Sussex has since attracted copious attention from both academics and everyday visitors. The site is exceptional in Britain for the imposing scale of the main Palace building, its elaborate floor mosaics, the delicately manicured garden, and an abundance of 'exotic' artefacts. These aspects provide a window to life in southern Britain from the pre-Roman Iron Age through to the later phase of Roman occupation (Cunliffe 1998). Cunliffe's (1971) excavations demonstrated the Palace as unique in Northern Europe, being the largest-known domestic 'Roman-style' building north of the Alps (Figure 9). Romano-British villas are well-known for their variety in form, function, and socio-economic status, and it is widely accepted that most sites which fall under the category of 'villa' do not necessarily represent the upper echelons of Romano-British society (Hingley 1989, 14; Smith 1997; Mattingley 2006, 367-370, 396-397). Fishbourne Palace, however, represents significant differences to other high-status buildings in Britain in terms of its extent, its material culture, and wider cultural setting, showing greater affinities with houses of the elite in the Mediterranean (Cunliffe 1971; 1998; Smith 1997; Russell 2006, 113-133).

Figure 9; Digital reconstruction of Fishbourne Palace at it might have looked in 1st-2ndC.AD with large internal garden (©archaeoweb.com)

The comparison of Fishbourne with Domitian's Palace in Rome indicates that elite social customs were widespread and may have filtered and transformed into new contexts at the far reaches of the Empire (Cunliffe 1971; 1998; Manley 2003). However, whilst a great deal is known about the Palace itself, very little interpretative work has been focused on the landscape context of the site. The archaeology at Fishbourne has revealed new styles of architecture, elaborate artwork, distinctive culinary forms, and extensive trade networks, all demonstrating the ostentatious lifestyles displayed by the residents of the Palace (Cunliffe 1971; Manley and Rudkin 2005; 2005; 2006). There are considerable links with the continent and a variety of evidence which points towards Imperial influence from an early stage (*ibid.* see also Russell 2006, 132-133). The zooarchaeology must then also be considered within a similar context.

The aim of this chapter is to present the zooarchaeological evidence in its entirety for Fishbourne as a single dataset. Whilst this does not make any significant advances in the study of Iron Age/Romano-British zooarchaeology, as noted in the previous chapter, it is intended that the dataset is openly accessible and, in terms of this thesis, it will be employed as a point of reference with the information available for further integration in the examination of themes in later chapters. Whilst this chapter deals with the analysis of the data, the dataset is presented in appendix C, and ultimately it will be comprehensively archived and stored online with the Archaeological Data Service (www.ads.adhs.ac.uk) for increased accessibility for other researchers. As an entity, Fishbourne Palace clearly represents a dramatic change to the social and political framework of southern Britain, not only to the elite who were constructing and living within such a building but also to the lives and perceptions of the 'common individual' to whom it would have been an imposing embodiment of power. Of course, Fishbourne did not exist in isolation and there are a number of local contemporary sites which were inhabited nearby, those detailed in Chapter 1. The data from these sites will also be used here in comparison to Fishbourne. However, to view the animal bone data at Fishbourne in the context of the wider animal economy of Britain across the Iron Age/Roman-British transition, it is necessary to examine data from across the country. This will allow us to lead into a detailed examination of the data from Fishbourne and its local contemporaries.

3.1 Fishbourne in Context: Livestock Exploitation

It is now widely accepted that a shift from sheep to cattle husbandry took place from the Iron Age to Roman period in Britain (Albarella 2007; Albarella *et al.* 2008; King 1978; 1999a;

Maltby 1984; Grant 1991). This has been repeatedly demonstrated by animal bone data, and is shown from my own analysis in Figure 10. Albarella (2007) places the emphasis for this change upon AD43, stating that 'this is a phase [the Iron Age] that especially deserves to be called the Sheep Age and anticipates the return to the Cattle Age [the Roman period] prompted by the Roman invasion' (*Ibid.* 389; my insertions). The 'Cattle Age' in this context is the Neolithic because cattle are seen here to have been pivotal to the agricultural revolution which took place at that time (Marciniak 2005, 41-42). By this rationale, the 'coming of the Romans' is also seen as a similar revolution in farming – a second civilising moment.

Figure 10 shows the frequencies of main livestock across the transition by site group, including the emerging urban and military settlements over the transition. Over the long term the pattern suggests that the domestic animal landscape of the middle Iron Age had a vastly different complexion to that of the late Roman period: a subsistence-based, sheep-rearing rurality later replaced by a market-driven, cattle-ranching landscape. When viewing these data by site group it becomes more apparent that, not only where these changes very slow, but the relative frequencies of livestock remains on late Iron Age compared to early Roman sites show very little difference, if any at all. They instead display nuanced variances seemingly brought about by developing settlement forms.

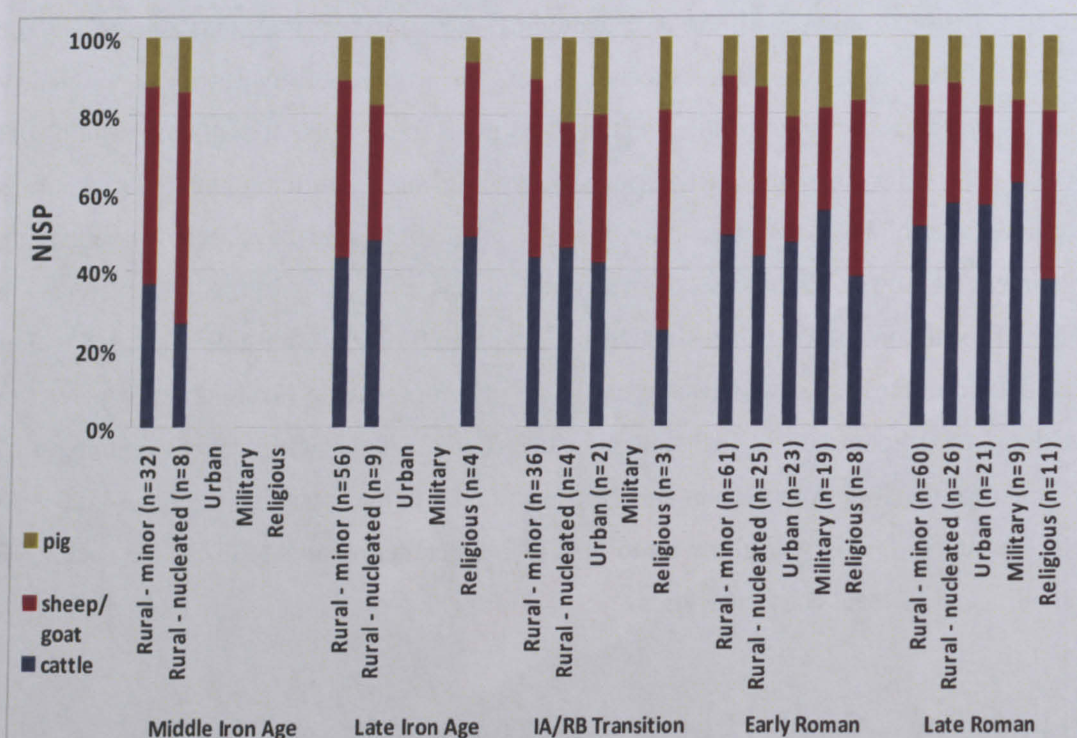


Figure 10; Relative frequency of cattle, sheep/goat and pig remains on British sites by phase and site grouping from national dataset.

My data adds little to this hypothesis in empirical terms except that it demonstrates the shift to have taken place from the middle Iron Age through to the end of Roman occupation; a period of around 800-900 years. The Roman Conquest may have accelerated changes in the agricultural landscape but, as an isolated event, it was simply part of a much longer process of change in animal husbandry and farming practice. Albarella's (*op cit.*) animal period labels are, in admittance from himself, 'caricatures of the reality' but they do provide a broad-based starting point. The shift from 'Iron Age sheep farming' to 'Romano-British cattle farming' must have formed part of, and indeed have been integral to, wider social changes (*cf.* Thomas 1996, 317). If the increase in cattle frequencies in Britain marks a change in the actions of farmers then the way the agricultural landscape was being used may have been altering; large increases in cattle presumably would have had quite a significant effect on the environment – both aesthetically and ecologically. We might expect larger tracts of land to be turned over to pasture (*cf.* Blench 2004, 13). However, if patterns of farming were changing, then there must also have been shifts in the husbandry practices in which these animals were involved.

Ageing data from cattle shed some light on this matter. The relative frequencies of cattle mandibles by wear stage show a slightly higher proportion of younger animals recovered from Iron Age sites, particularly middle Iron Age in date, compared to those from Romano-British sites (Figure 11). On Roman-dated sites (including 'transitional' sites) cattle mandibles are best represented around stages F and G, approximately 3 to 8 years old, to the point where these stages correspond to a peak frequency in the data against relatively minor occurrences of mandibles around stages A to C. This pattern is, on the whole, different to frequencies on Iron Age sites where the data are more equally spread out over all age groups. The one anomaly in this pattern is the peak at wear stage J. This is produced by the assemblages from late Iron Age phases at the village settlement at Dragonby in Lincolnshire and the farmstead at Owslebury in Hampshire, whilst being contributed to at a lesser extent by the remains from the enclosed settlement at Balksbury Camp, also in Hampshire.

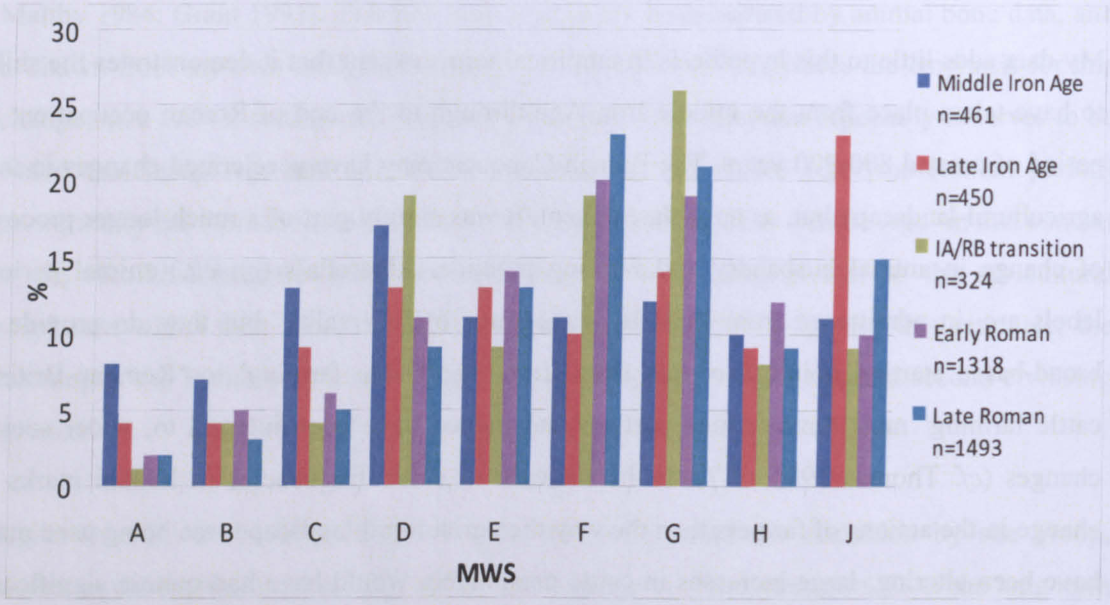


Figure 11; Relative frequency of cattle mandibles by mandible wear stage from Iron Age and Romano-British sites by phase. N.B. Calculated as the percentage of the total number of mandibles from each site (n=number of samples).

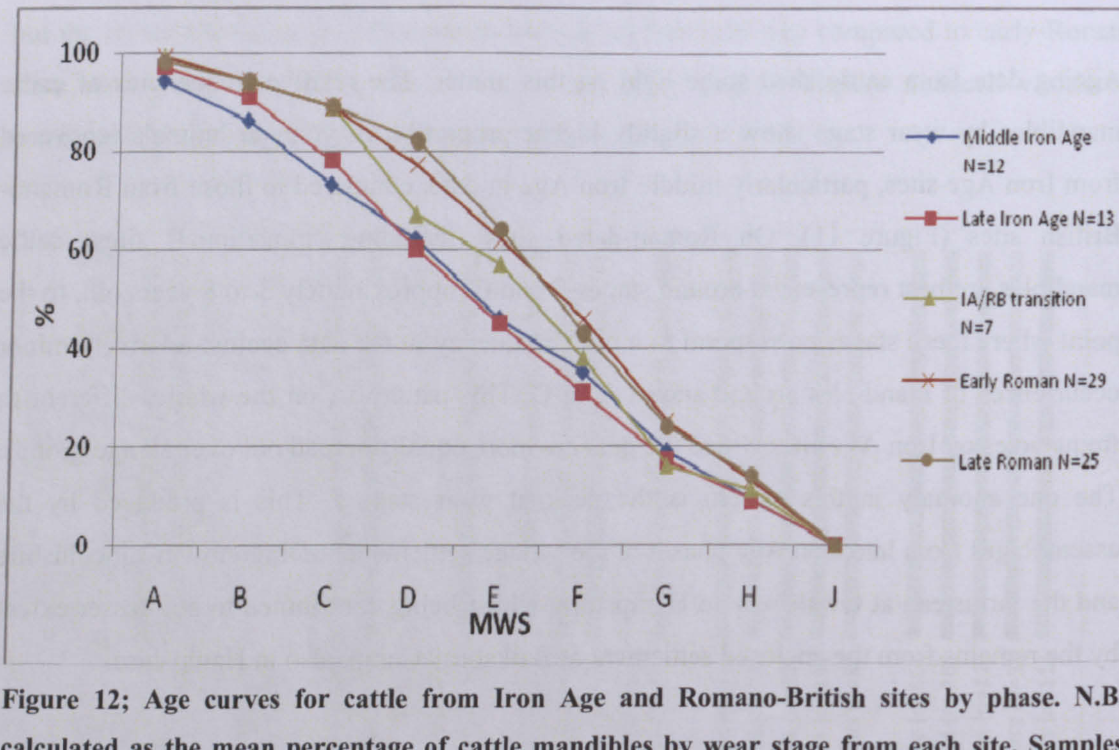


Figure 12; Age curves for cattle from Iron Age and Romano-British sites by phase. N.B. calculated as the mean percentage of cattle mandibles by wear stage from each site. Samples sizes of less than 10 are removed (n=number of sites)

This anomaly is largely removed when the data are converted into mean percentages and expressed as age curves exhibited in Figure 12. Middle and late Iron Age sites share a very similar age curve, whereas early and late Roman sites share an approximately equal curve but at a slightly increased frequency to the Iron Age pattern indicating a tendency for a greater proportion of cattle surviving at each age stage. Interestingly, the age curve produced by data from transitional sites meanders between the two, from an 'Iron Age' pattern of greater culling of elderly cattle towards the 'Romano-British' curve of increased calf survival. Statistical analysis indicates that significant differences exist in assemblages at stages B to D, depending on the phase in question, from late Roman sites compared to all those previously (Table 11). This applies to cattle from neonates to 2 years of age, and would suggest that cattle husbandry had modified by the $2^{nd}/3^{rd}$ centuries AD. There were no significant differences between data from early Roman sites compared to Iron Age sites however, providing less evidence of change across the transition. The shift in trajectory seen in the 'Iron Age' curve compared to the 'Romano-British' curve certainly begins at individuals around stages B-C, as the statistical analysis suggests for late Roman sites. It is tempting, therefore, to argue that subtle alterations took place into the early Roman period, though these had not become fully developed across the province until a couple of centuries later. As the focus of change is mainly on cattle in their early stages in life the data indicates that any shift in husbandry practices were solely on the manner in which animals were reared as calves, as already noted a greater frequency were surviving in the Roman period compared to the Iron Age.

Table 11; Cattle dental ageing wear data – summary statistics from the mean values from each site in the national dataset. Only sites with sample sizes >10 are summarised and tested here.

Phase	Summary statistics						Statistical difference between periods (*P*)			
Middle Iron Age	MWS	no. samp.	min	max	mean	SD	LIA	IA/RB	ERB	LRB
	A	7	2.6	17.0	10.1	4.7	N	N	N	N
	B	7	4.0	21.1	14.1	7.2	N	N	N	XXX
	C	11	2.6	31.3	14.7	10.1	N	N	N	XX
	D	11	5.0	26.3	14.6	11.2	N	N	N	N
	E	11	3.0	90.9	17.1	24.9	N	N	N	N
	F	10	1.0	47.1	18.0	15.5	N	N	N	N
	G	11	2.0	43.8	19.1	12.7	N	N	N	N
	H	9	5.3	26.3	13.7	6.7	N	N	N	N
	J	7	1.0	18.9	15.1	10.9	N	N	N	X
Late Iron Age	MWS	no. samp.	min	max	mean	SD	LIA	IA/RB	ERB	LRB
	A	5	3.3	14.3	8.2	4.3		N	N	N
	B	10	3.0	35.3	9.8	10.2		N	N	N
	C	11	2.0	38.5	15.4	12.8		N	N	X
	D	14	2.0	61.5	19.4	16.5		N	N	X
	E	14	5.9	35.7	15.3	10.9		N	N	N
	F	13	1.7	36.0	14.2	10.0		N	N	N
	G	12	7.1	57.9	20.5	14.2		N	N	N
	H	8	7.1	14.3	12.2	4.1		N	N	N
	J	7	2.9	47.5	20.4	21.6		N	N	N
IA/RB Transition	MWS	no. samp.	min	max	mean	SD	LIA	IA/RB	ERB	LRB
	A	1	-	-	8.3	-			N	N
	B	3	8.3	11.4	9.6	1.6			N	XX
	C	6	1.0	8.3	5.8	3.1			N	N
	D	6	4.0	58.0	20.8	19.5			N	N
	E	5	3.7	28.6	12.5	10.4			N	N
	F	6	3.0	74.1	21.7	27.1			N	N
	G	4	5.0	70.4	24.5	30.8			N	N
	H	4	6.0	20.0	10.8	6.4			N	N
	J	2	17.0	58.0	37.4	29.2			N	N
Early Roman	MWS	no. samp.	min	max	mean	SD	LIA	IA/RB	ERB	LRB
	A	7	2.0	21.1	8.8	6.1				N
	B	13	1.0	27.3	11.2	8.7				XXX
	C	18	1.0	21.2	9.7	10.6				N
	D	24	2.5	46.0	12.9	11.1				N
	E	24	3.4	50.0	17.2	13.3				N
	F	22	4.3	77.0	26.1	22.6				N
	G	23	2.6	58.8	24.4	17.0				N
	H	18	6.1	52.6	18.9	11.6				N
	J	13	1.8	55.2	23.3	16.0				N
Late Roman	MWS	no. samp.	min	max	mean	SD	LIA	IA/RB	ERB	LRB
	A	7	2.2	12.5	5.5	3.6				
	B	16	1.0	11.8	4.4	3.5				
	C	18	1.0	18.2	7.4	4.8				
	D	21	1.0	30.6	10.3	8.2				
	E	23	1.9	44.9	14.4	12.5				
	F	24	2.5	88.9	24.0	21.4				
	G	20	2.3	77.3	25.9	18.3				
	H	17	5.2	24.2	13.8	6.6				
	J	12	2.0	63.0	31.9	19.3				

Results of the t-test for unpaired results: X = significant at the 95% confidence interval; XX = significant at the 99% confidence interval; XXX = significant at the 99.9% confidence interval; N = result was not significant.

The mandible wear data from sheep/goats in Figure 13 suggests that, as with cattle, caprines on Iron Age sites tended to be slaughtered slightly earlier than on their Romano-British counterparts. A greater proportion of mandibles at wear stages B and C are recovered at middle and late Iron Age settlements, whereas those at stages D, E and F are better represented from excavations of Roman date. This may indicate a slight overall difference in practices involving sheep/goats between the two phases. When these data are converted to the mean percentage of samples from sites to mitigate the presence of anomalous sample sizes, the age curves for sheep/goat show that a minimal difference in husbandry regimes occurred between each phase from the middle Iron Age to the late Roman period (Figure 14). Again there is a slight tendency for allowing a greater proportion of younger animals, approximately 2 months to 3 years of age (stages B to E/F), to survive on Roman-dated sites.

Statistical analysis indicates that there is a significant difference between the mean proportions of sheep/goat specimens at stage C between middle and late Iron Age sites compared to early and late Roman sites (Table 12). Significant differences also exist between the mean values of specimens at stage A at late Iron Age sites compared to those in each of the other phases. The differences seen in the late Iron Age stage A data is not picked up in the graphs, but it does suggest that a greater frequency of very young sheep did not survive this age during this period. It could be argued that any difference which occurred through the late Iron Age led to the differences between the Iron Age and Romano-British stage C data. It must be said that this latter disparity was highly significant, beyond the 99.9% confidence interval and suggests a fundamental change in sheep husbandry involving animals around 1 year of age existed across the transition. As with cattle, a greater frequency of livestock survives to older ages in the Roman period.

The ageing data suggest that livestock husbandry practices altered slightly in Britain across the Iron Age/Romano-British transition. These changes seem to have been manifest on animals around 1 year old rather than affecting whole populations. Both cattle and sheep show evidence of surviving to older ages in greater frequency between the Iron Age and Roman phases, whilst the relative frequencies suggest that cattle increased at the expense of sheep. One might argue that Britain experienced either an increase in agricultural production or an increase in cattle ranching (or both).

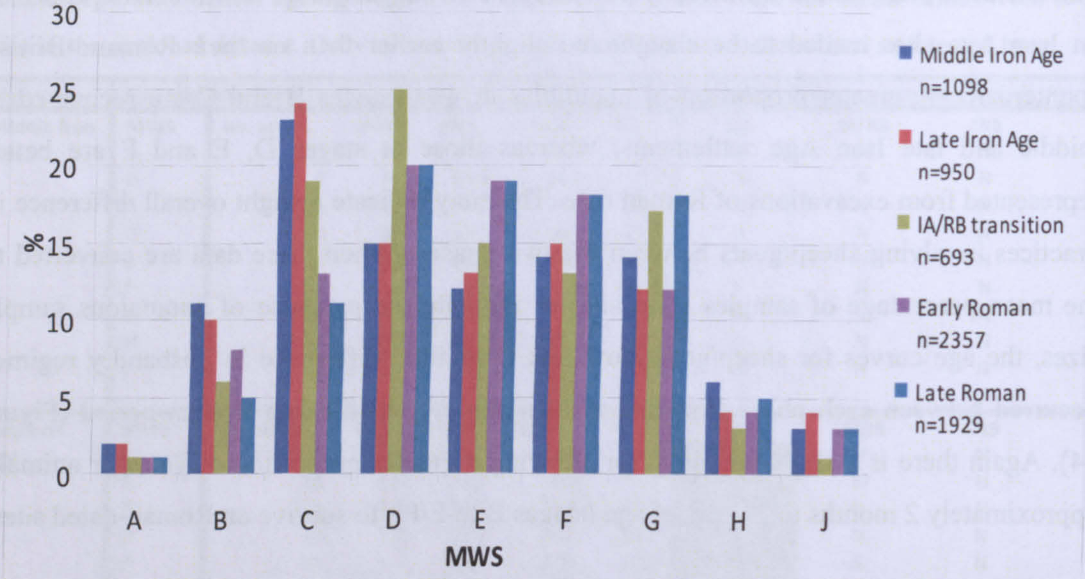


Figure 13; Relative frequency of sheep/goat mandibles by mandible wear stage from Iron Age and Romano-British sites by phase. N.B. calculated as the percentage of the total number of mandibles from each site (n=number of samples).

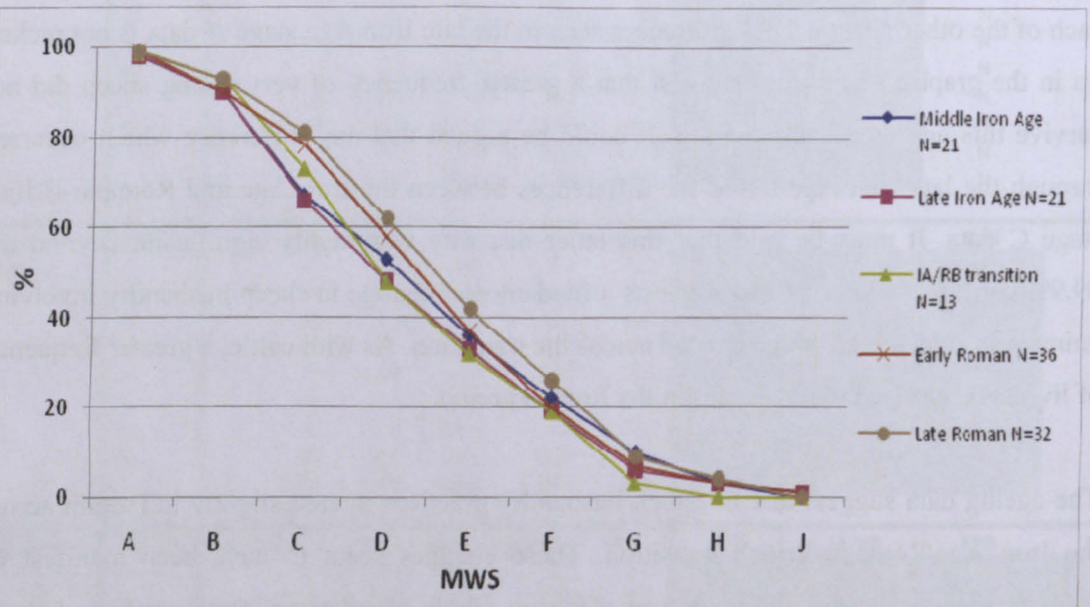


Figure 14; Age curves for sheep/goat from Iron Age and Romano-British sites by phase. N.B. calculated as the mean percentage of sheep/goat mandibles by wear stage from each site. Samples sizes of less than 10 are removed (n=number of sites)

Table 12; Sheep/Goat dental ageing wear data – summary statistics from the mean values from each site in the 'national' dataset. Only sites with sample sizes >10 are tested here.

Phase	Summary statistics						Statistical difference between periods (*P*)			
Middle Iron Age	MWS	no. samp.	min	max	mean	SD	LIA	IA/RB	ERB	LRB
	A	9	2.0	8.8	4.5	2.2	XX	N	N	N
	B	14	3.2	32.7	13.0	8.5	N	X	N	N
	C	20	4.8	40.2	24.4	11.3	N	N	XXX	XXX
	D	18	3.2	76.4	16.8	16.5	N	N	N	N
	E	19	1.8	47.1	16.4	12.7	N	N	N	N
	F	18	5.9	32.3	16.7	6.8	N	N	N	N
	G	19	1.8	31.4	14.1	8.3	N	N	N	N
	H	13	1.8	38.5	11.5	11.8	N	N	N	N
	J	6	1.0	33.7	9.7	12.9	N	N	N	N
Late Iron Age	MWS	no. samp.	min	max	mean	SD	LIA	IA/RB	ERB	LRB
	A	14	3.2	32.7	13.0	8.5		X	XX	X
	B	19	3.7	26.9	9.4	6.2		N	N	N
	C	20	6.3	42.3	24.5	11.8		N	XXX	XXX
	D	20	2.3	72.7	18.8	15.1		N	N	N
	E	21	4.0	27.3	15.0	6.8		N	N	N
	F	18	3.0	29.6	16.8	7.3		N	N	N
	G	20	2.4	33.3	14.5	9.3		N	N	N
	H	10	1.0	8.3	6.9	5.3		N	N	N
	J	5	1.0	31.0	7.9	13.0		N	N	N
IA/RB Transition	MWS	no. samp.	min	max	mean	SD	LIA	IA/RB	ERB	LRB
	A	5	1.5	5.4	3.3	1.6			N	N
	B	12	1.2	14.3	6.7	4.9			N	N
	C	14	4.7	47.1	19.1	11.8			N	N
	D	14	14.0	43.5	24.5	7.6			N	N
	E	14	7.0	27.3	15.5	7.8			N	N
	F	13	5.0	22.0	13.9	5.9			N	N
	G	14	4.4	40.0	16.3	11.1			N	N
	H	7	2.0	18.0	7.4	6.5			N	N
	J	2	2.0	11.5	6.8	6.7			N	N
Early Roman	MWS	no. samp.	min	max	mean	SD	LIA	IA/RB	ERB	LRB
	A	13	1.0	9.4	4.1	3.7				N
	B	28	1.0	34.6	11.7	12.1				N
	C	31	1.9	38.0	14.2	8.9				N
	D	33	1.1	47.0	21.6	11.5				N
	E	36	1.9	83.3	21.4	14.9				N
	F	31	6.7	55.8	19.8	12.6				N
	G	36	2.0	46.7	15.7	10.8				N
	H	22	1.0	28.6	7.3	6.5				N
	J	12	1.0	31.0	5.5	8.4				N
Late Roman	MWS	no. samp.	min	max	mean	SD	LIA	IA/RB	ERB	LRB
	A	7	1.0	18.4	4.0	6.4				
	B	21	1.9	24.4	8.5	6.1				
	C	30	1.6	29.1	13.3	9.1				
	D	30	2.0	59.0	19.8	11.3				
	E	28	1.8	81.8	21.0	17.5				
	F	28	1.8	42.0	18.7	11.6				
	G	28	1.8	55.8	19.5	12.7				
	H	19	2.0	33.3	8.5	7.9				
	J	13	1.0	23.6	10.1	12.1				

Results of the t-test for unpaired results: X = significant at the 95% confidence interval; XX = significant at the 99% confidence interval; XXX = significant at the 99.9% confidence interval; N = result was not significant.

The ageing data for cattle indicates largely different patterns from different types of site in all phases (Figure 15-Figure 30). Patterns from rural sites in each phase tend to indicate a relatively even spread of ages from neonatal to elderly animals. There are rarely indications of selectivity of any particular age group. Nucleated sites of different type in Iron Age phases show evidence for selectivity for particular age groups, such as the high proportions of 1-2 year olds (stage D) at middle Iron Age hillforts, or older animals at late Iron Age oppida. Early Roman villas show evidence for the selection of animals of certain age (Figure 22), whereas these change into the late Roman period as villa sites seem to conform to patterns similar to other rural sites (Figure 27). This is an important pattern as, whilst sites of different types in the early Roman period all show differences in cattle ageing, in the late period there is a move towards homogeneity between farms (small rural and villas) and all nucleated sites (urban, small town, and military). The evidence suggests that to some degree a stricter distinction formed between 'producers' and 'consumers' through the Roman period, possibly as a long term response to the development of the market economy. In this sense the idea of what it meant to be 'rural' or 'urban' formed over many years.

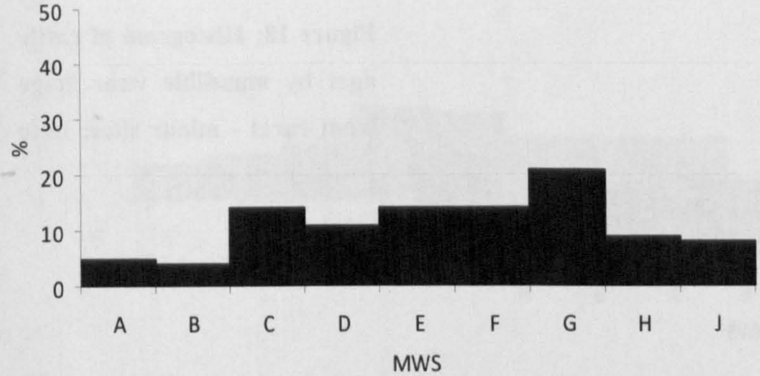


Figure 15; Histogram of cattle ages by mandible wear stage from rural - minor sites: Middle Iron Age (n=12)

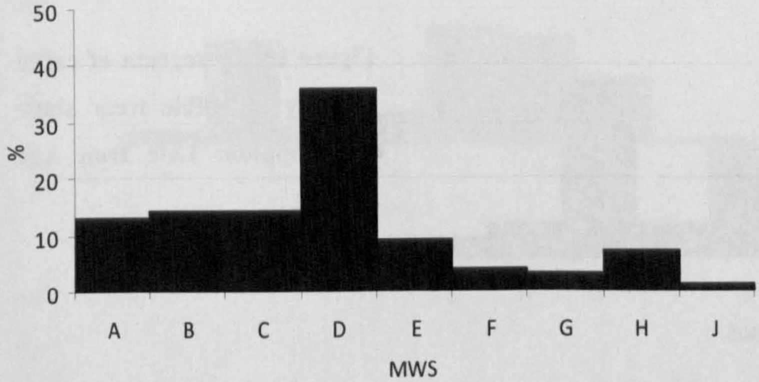


Figure 16; Histogram of cattle ages by mandible wear stage from hillforts: Middle Iron Age (n=2)

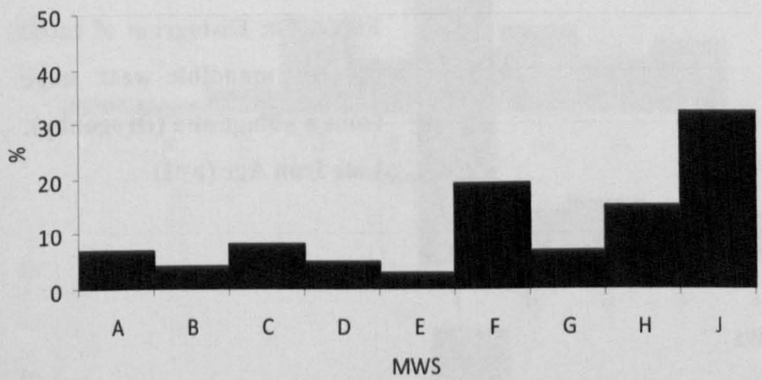


Figure 17; Histogram of cattle ages by mandible wear stage from a village site (Dragonby): Middle Iron Age (n=1)

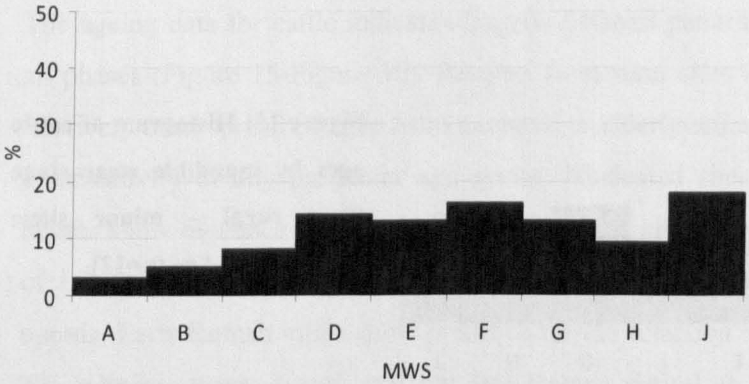


Figure 18; Histogram of cattle ages by mandible wear stage from rural - minor sites: Late Iron Age (n=14)

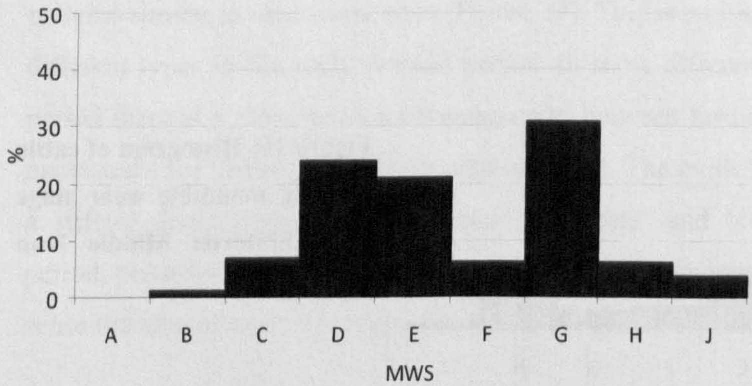


Figure 19; Histogram of cattle ages by mandible wear stage from oppida: Late Iron Age (n=3)

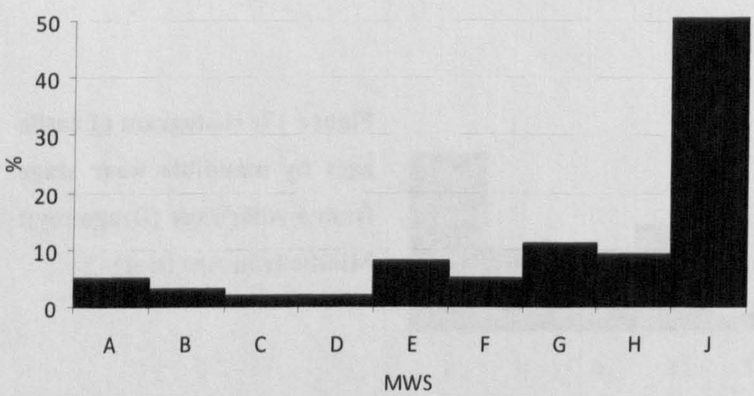


Figure 20; Histogram of cattle ages by mandible wear stage from a village site (Dragonby): Late Iron Age (n=1)

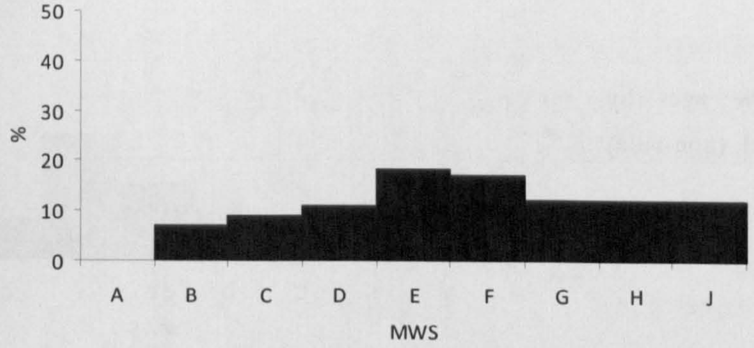


Figure 21; Histogram of cattle ages by mandible wear stage from rural (non-villa) sites: Early Roman (n=11)

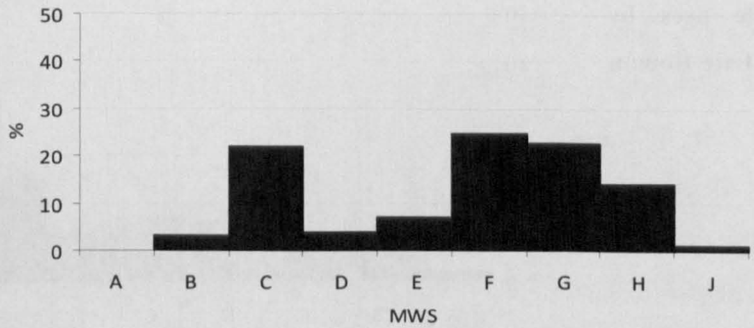


Figure 22; Histogram of cattle ages by mandible wear stage from villas: Early Roman (n=2)

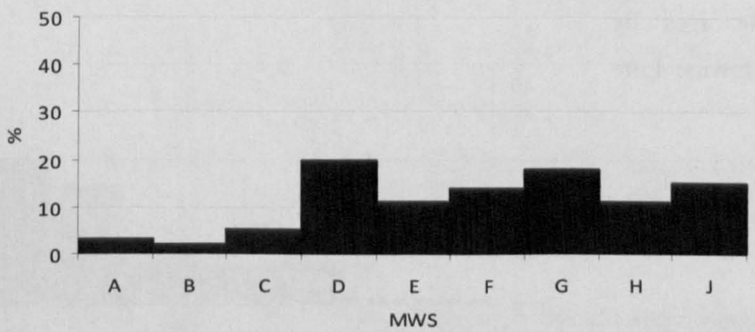


Figure 23; Histogram of cattle ages by mandible wear stage from small towns: Early Roman (n=11)

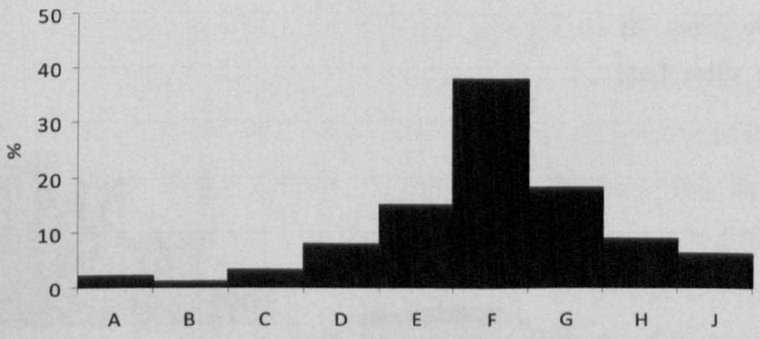


Figure 24; Histogram of cattle ages by mandible wear stage from urban sites: Early Roman (n=7)

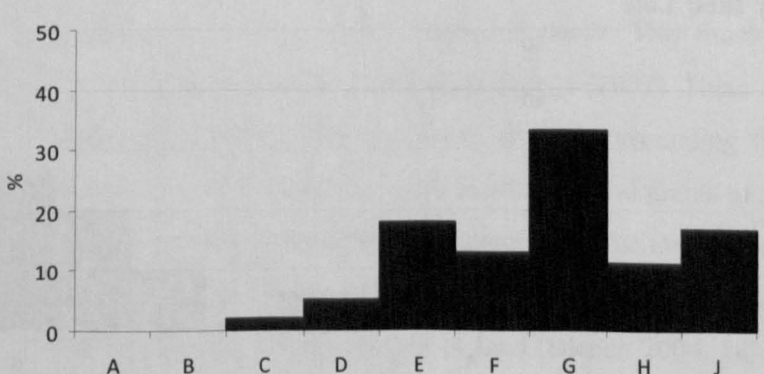


Figure 25; Histogram of cattle ages by mandible wear stage from military sites: Early Roman (n=6)

Figure 26; Histogram of cattle ages by mandible wear stage from rural (non-villa) sites: Late Roman (n=8)

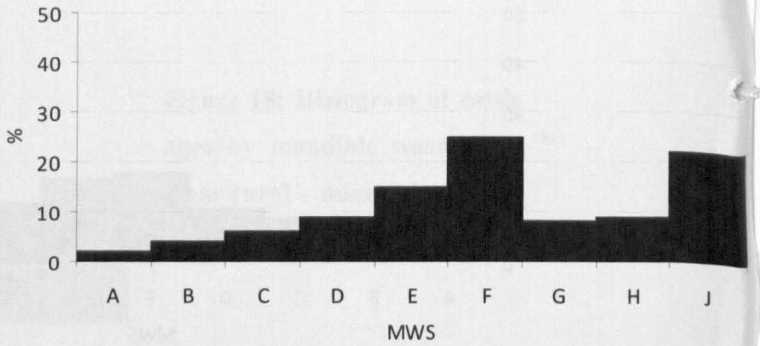


Figure 27; Histogram of cattle ages by mandible wear stage from villas: Late Roman (n=5)

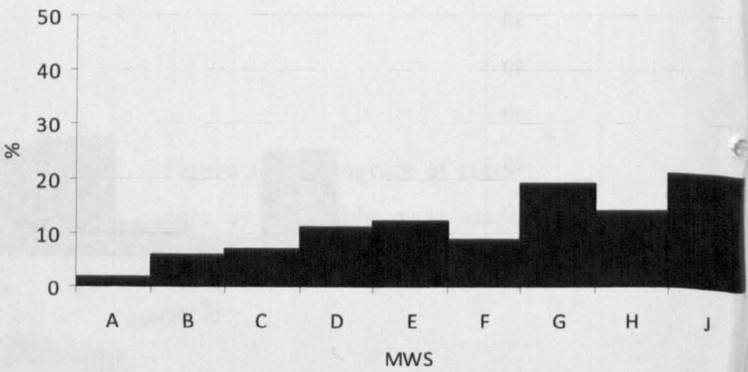


Figure 28; Histogram of cattle ages by mandible wear stage from small towns: Late Roman (n=7)

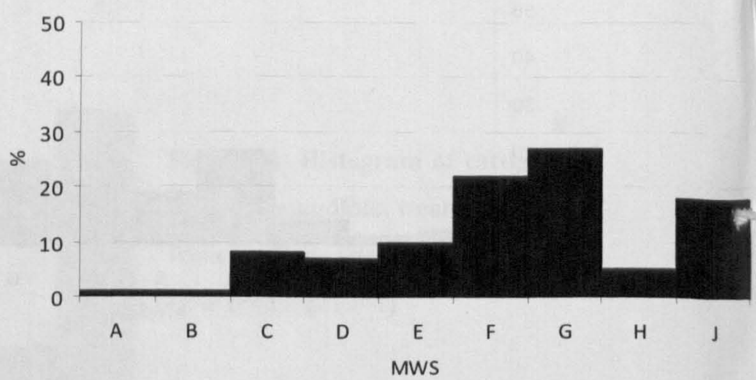


Figure 29; Histogram of cattle ages by mandible wear stage from urban sites: Late Roman (n=6)

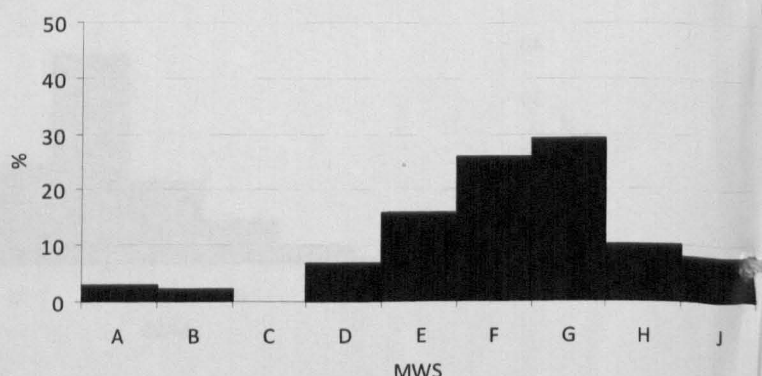
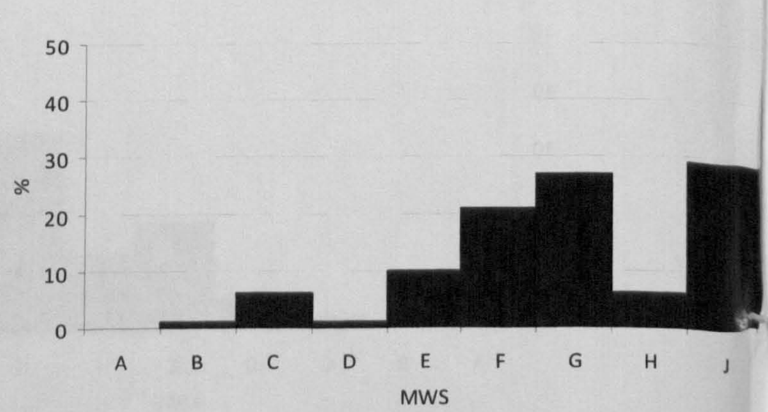


Figure 30; Histogram of cattle ages by mandible wear stage from military sites: Late Roman (n=2)



The historical sources suggest that arable and pasturage sat uncomfortably alongside one another. The role of livestock management actually became something of an ecological issue at this point in time. Not all farming landscapes and practices were 'ideal' to everybody. Pliny the Elder (*Hist. Nat.* 18.7) complained: 'The large estates are ruining Rome as well as its provinces.' This statement was in response to the large-scale transfer from cultivation to stock-raising (Donald-Hughes 1994, 145). Whilst the conversion of arable to pasturage was punishable by Roman law, it seems not to have been effective and was opposed by the wealthiest citizens (*ibid.* 146). The agronomist Cato was clearly one such citizen who approved of widespread pasturage clearly favouring the profitability of large herds of grazing livestock (Cicero, *On Offices* 2.25). In Cato's work, the farming landscape was entwined with the ethics of 'hard work', and yet his doctrine was dismissed by Varro who argued that too much land given over to stock-rearing was harmful, depriving arable land of animal services such as vegetation control and soil fertilisation (Donald-Hughes 1994, 146). Varro (2.20/21) states that we cannot talk about cattle within the subject of agriculture unless it is from the point of view of their role in improving the productive nature of the land either by ploughing under the yoke or manuring. He alludes to the fact that cattle can be kept not for the purpose of agriculture but simply as a grazer, referring to cattle ranches where the animals are kept economically for beef production, and are social indicators of wealth (*ibid.*). He does not promote this concept however.

Whilst much of this writing concerned Roman Italy, people were approaching livestock and the environment as indivisible phenomena. They clearly affected each other and, evidently, different people had different perceptions of the farming landscape. The shift from sheep/goat farming to cattle-rearing from the Iron Age to Roman period is unlikely to have coincided with wholesale changes to farming practice as the shifts in the ageing data seem to be too subtle and too specific. Changes may well have manifested in different areas. Certainly changes in settlement patterns took place in different degrees and at various stages in Roman Britain, whilst in some areas no change can be detected at all (Taylor 2007). Of course, this must mean that in other areas the differences were more noticeable, possibly surrounding military installations or urban centres where the local farming landscape might alter to reinforce changing economic needs. This much has been suggested by Taylor's review of settlement and landscape change (2007). There has even been the suggestion from Mattingley (2006, 360) that areas of land surrounding the 1st century *coloniae* in Britain underwent centuriation schemes to allocate land grants to army veterans. It is common in the modern world, where colonial movements have taken place over the past few centuries, for cattle ranching to expand in areas where there has been a need to make public displays of ownership over wide stretches of land (Blench 2004, 18). There is certainly evidence from the late Iron Age/Romano-British site at Elms Farm, close to the colony at Colchester, Essex, that significant changes to cattle husbandry practices took place over the transition (Albarella *et al.* 2008). With these contexts in mind we can now turn back to the case study of Fishbourne Palace.

3.2 Excavations and the Dating and Development of the Palace

The location of Fishbourne and other sites in its hinterland are shown in Figure 1.2 (Chapter 1). The 1960s excavations included the inputting of over 400 trenches across an area covering almost 25000m^2. Later excavations, particularly those east of the Palace between 1995-2002 (Manley and Rudkin 2003; 2005; 2006), the excavation at Westward House (FB92) situated 150m further east (Kenny 1992) and in the harbour area to the south (FBH82-83) (Rudkin 1986), have added considerable detail to our knowledge of the settlement. Extensive excavations took place along the line of the A27 dual carriageway, which now runs adjacent to the site, during 1985 and 1986 (Cunliffe *et al.* 1996). These revealed evidence of substantial agricultural or horticultural activity in the area east of the Palace between the 1995-2002 excavations and those at Westward House. Unfortunately, bone material was not retained from these excavations due to financial and storage constraints and is not available for study in this thesis.

Dating phases of activity at Fishbourne has been intensely debated (Cunliffe 1971; Creighton 2006, 59-61; Russell 2006, 23-30). The discovery of 'military-style' granaries prompted Cunliffe (1971) to interpret the development of the site against a historical timeline, beginning in AD43 with the arrival of the Roman Army using the area as a staging-post for movement into enemy territory. This version of events gives the impression that the site was imposed on virgin land and existed for a short period as a military site which suddenly turned over to being a civilian settlement. Whilst Cunliffe's (1971) stratigraphic recording of the Palace and its precursors could easily fit the historical timeline, much of the imported pottery evidence, which includes Italian and Gaulish Arretine ware as well as Gaulish Terra Rubra and Terra Nigra of certain pre-Claudian date (*cf.* Dannell 1971, 260-268), did not. One major problem with pre-Palace dating is that, because the site is situated on a natural slope, much of the western side was dug into when laying the foundations for the Palace with the resulting earth, and any features which lay within, being re-deposited on the eastern side to level the area (D.Rudkin pers. com.). Clearly any contexts dating to before this period below the Palace would be severely mixed. However, since the 1960s excavations further indications of late Iron Age activity have surfaced. At Westward House (FB92) due east of Fishbourne Palace, the remains of a small timber-framed structure was excavated, from which a late Iron Age butt beaker used as a funery urn was recovered (J.Kenny pers. com.). To the south of this site, another excavation (FB94-95) produced the first evidence of 'Iron Age-style' round houses in the area. As with the 'Augustan' pottery from the Palace these discoveries do not positively demonstrate pre-AD43 activity on site. Other butt beakers had been recovered closer to the Palace mixed with 'Claudian' pottery (Manley and Rudkin 2003, 139), and it was also common for round-houses to accompany villa buildings on many British sites of Roman date (Mattingley 2006, 367).

The first concrete evidence of pre-Conquest activity at Fishbourne was uncovered in 1999 and 2002. The excavation of a ditch north of building 3 by Manley and Rudkin (2005) produced an undisturbed primary silt deposit containing pottery dated to 10BC-AD25. The discovery led Manley and Rudkin (2003, 136-138) to openly suggest that the granaries, bath-house, roads, and building 3 were all pre-Conquest. This interpretation uses a 'rethreading' of 1960s and the 1995-2002 stratigraphy rather than single context dating because of the problems already noted above; a predicament encountered by Cunliffe (1971) in the first instance. The consequence of Manley and Rudkin's (2003, 132-133) interpretation is that it reforms, yet supports, Cunliffe's original idea of an imposed 'military landscape' but one which now includes a *Principia*, or Roman army headquarters (building 3); though once more the evidence for this is speculative. Creighton (2006, 59-61) concedes that 'we now face the possibility of there having been a reasonably substantial 'Romanised' settlement at Fishbourne in the late Iron Age with military-style ditches, metalwork and maybe roads, let alone the possibility of granaries and a bath-house', but he, at the same time, also stresses other suggestions outside of the Roman military context. Creighton (2006, 68-69) has now argued that many cultural similarities existed between Fishbourne and other oppida including features which cannot be interpretively compartmentalised into modern dichotomies of 'Native/Roman' or 'Military/Civilian'. Extensive storage facilities are also associated with late Iron Age 'royal' enclaves as much as they were with Roman military instillations (*ibid.* 60).

In all, the focus upon rigid timelines has led to interpretations which are now entrenched within limited evidence, making further study of archaeological remains complicated and confusing for new researchers of the site. As seen here, the desire of the archaeologist to place chronological boundaries onto our excavated settlements and historic landscapes can, ironically, end up blurring our vision of the past. Creighton (2006, 54-69) has warned against placing the evidence against an unyielding historical timeline and proposes that Fishbourne was simply one of a number of areas controlled by late Iron Age/early Roman 'Royal' dynasties which existed in the south of Britain. In similar vein, Cunliffe (in Manley and

Rudkin 2003, 5) rightly points out that '[t]here is … no need to interpret any of the presently-known structures as belonging to the pre-conquest period'. We know that activity took place at Fishbourne both prior to and beyond the Roman Conquest, and however dramatic this event might have been it does not mean that life at Fishbourne altered consequentially. The importance of Fishbourne in our understanding of the Iron Age/Romano-British transition is that it existed at all.

Excavation	Phase 1 *c.*1stC.BC-AD	Phase 2 *c.* late 1st-2ndC.AD	Phase 3 *c.* late 2nd-3rdC.AD	Phase 4 *c.* late 3rd-4thC.AD
FB61-68	1A	2	3	4
	1B			
	1C			
FB69		*c.*AD75-180	*c.*AD150-300	
FB80		*c.*AD75-100		
FB81		*c.*AD75-100		
FBH82-83		*c.*AD50-150	*c.*AD150-300	
FBS83		AD43-45		
FBP84		1st-2ndC.AD		
FBN86		*c.*AD75-100		
FBW87/88	*c.*AD43-75	*c.*AD75-180	*c.*AD180-280	
		*c.*AD80-100		
FB92	*c.*AD0-75	*c.*AD75-150	*c.*AD150-300	*c.*AD300-400
FB94-95	2nd-1stC.BC	1st-2ndC.AD	2nd-3rdC.AD	
FBA95	1stC.BC	1st-2ndC.AD	late 1st-3rdC.AD	
	1stC.AD			
FBB95		1st-2ndC.AD		
FBE95-02	AB	AC	AG	CG
	BA	AD	AH	CH
	BB	AE	CF	
	BC	AF		
	CA	BD		
	CB	BE		
	CC	BF		
		CD		
		CE		
FBH96			*c.*2nd-3rdC.AD	
FB98		1st-2ndC.AD	late 1st-3rdC.AD	early 4thC.AD
		late 1stC.AD	late 2nd-3rdC.AD	
		mid 1st-2ndC.AD	3rdC.AD	
		late 1st-2ndC.AD		
FBS99		1st-2ndC.AD		
FBC06	1stC.AD			

Table 13; Appropriated Phase groups with approximate date range of assemblages from Fishbourne excavations. The original phasing given for each excavation derives from the publication source or from archive material.

The problems associated with the chronology of the site, as detailed above, provide the dataset collected for this thesis with numerous difficulties, particularly as each excavation has inconsistent sets of criteria by which features and materials are dated. Clearly the animal bone data need to be arranged within a phasing system so that each assemblage can be made comparable and together show temporal changes which occurred across the settlement.

Overall I have arranged the data-set into four phases, as detailed in Table 13, which correspond approximately with Cunliffe's (1971) original phases but with an updated chronology to take into account the discoveries made since original publication. For example, the period of activity surrounding the late Iron Age ditch and Cunliffe's 'military phase' are now taken together. This seems to be the most suitable way of arranging the data-set, though I accept that there may have been differences in site activity over time within each phase. It remains viable to examine single contexts with tighter dating alongside my phasing framework. I have given the approximate date ranges below each Phase, i.e. Phase 1 = *c.*1stC.BC-AD. I will refer to the 'date' rather than the 'phase' in the text though this should not be taken as absolute dating and is instead designed to give the reader a relative idea of time and the broader temporal differences between each period. The boundaries between each phase should be regarded as fluid with each phase being transitional from one to the next.

3.3 Zooarchaeological Assemblages

Table 14 details the different excavations which have contributed animal bone material to the final Fishbourne data-set used in this thesis. These projects are currently at a variety of stages in terms of their written records. A few have reached final publication (e.g. FB61-69, FBH82-83, FBE95-02), some are selectively detailed within interim reports (e.g. FB92), and others have received little or no formal examination, surviving in archive as unpublished reports or contexts sheets. There are additional excavations which have been carried out at Fishbourne though these are either sites where bone material exists but which cannot be contextualised via a lack of archive information; where no bone was recovered from excavation; or where the original location of the bone is currently unknown.

Over the years the excavation and analysis of Fishbourne, by various directors, has been exemplary for continually using the study of animal remains to enable greater resolution of the social and economic life of the site (Cunliffe 1971; Manley and Rudkin 2003; 2005; 2006). The integration of faunal remains within overall interpretations of the site has increased as the techniques involved in zooarchaeology have developed and as its importance within archaeology as a whole has received greater recognition. However, this development has been piecemeal as bone assemblages from different excavations have been analysed separately (Grant 1971; Eastham 1971; French 1986; Sibun 2003; Sykes 2005; Sykes *et al.* 2006b) or have focused on a few samples where important re-identifications have been made or via the use of innovative scientific techniques (Sykes 2004; Sykes *et al.* 2006a; Allen 2009).

Excavation Code	Nature of Site/Features/ Site Location	Approximate Date/Phase (as offered by excavator)	Information Source
FB61-68	Main Palace	AD43-280	Cunliffe 1971
FB69	South garden	Roman	Cunliffe *et al.* 1996
FB80	Under Palace mosaic	1st - 2nd C.AD	Cunliffe *et al.* 1996
FB81	Under Palace mosaic	1st - 2nd C.AD	Cunliffe *et al.* 1996
FBH82-83	Fishbourne Harbour site	Roman	Rudkin 1986
FBS83	Construction layer: Underlies	AD43-45	Cunliffe *et al.* 1996
FBP84	Unknown	1st - 2nd C.AD	Archive
FBN86	Under mosaic N3	1st - 2nd C.AD	Cunliffe *et al.* 1996
FBW87-88	Proto-palace building	Roman	Cunliffe *et al.* 1996
FB92	Westward House	late IA/Roman	Kenny 1992/Archive
FB94-95	Ditches and layers: SSW of	late IA – medieval	Archive
FBA95	Building, ditches & pits	late IA – medieval	Archive
FBE95-02	East of Palace	late IA/Roman	Manley and Rudkin 2003; 2005; 2006
FBH96	Trench alongside harbour site	2nd - 3rd C.AD	Archive
FB98 (FBB95)	Aqueduct; ditches/gulleys;	1st - 3rd C.AD	Archive
FBA98	Ditch; field boundary: 49	1st - 2nd C.AD	Archive
FBS99	Wall; undisturbed layers:	1st - 2nd C.AD	Archive
FBC06	No dateable features	Roman	Archive

Table 14, Outline of excavations carried out at Fishbourne between 1961 and 2002. The numbers given in the excavation codes relate to the year the fieldwork was carried out.

The animal bone reports of Grant (1971) and Eastham (1971) need not be reviewed in detail here as their subject material included only a subsample of the full assemblage, which has been analysed in its entirety for this thesis. However, their reports included up-to-date methods of data analysis such as species/element proportions, ageing, and metrics, which were important for providing new types of information. For example, the high frequency of pig remains compared to sheep and cattle at Fishbourne was first recognised by Grant (1971, 387-388), a trend which came to be used as a marker for 'Romanisation' (King 1991, 15). Their work was part of an innovative move by Cunliffe (1971) to use the analysis of faunal remains for interpreting human activity at the site.

Between 1969 and 1995, a variety of smaller excavations were carried out: the southern part of the west wing in 1987-1988 was excavated by Rudkin (Cunliffe *et al.* 1996, 69-87) from which a small assemblage was recovered from this excavation which had lain unanalysed prior to this thesis. In 1992 Southern Archaeology excavated a large area at Westward House east of the Palace which uncovered evidence of the main water supply to the Palace as well as some very early structures (Kenny 1992, 32-37). A reasonably-sized faunal assemblage was excavated from this site and was assessed by Ingrem (2004). I have now analysed this assemblage in full. Due southwest, on the western bank of the estuary, a large 'aisled hall' villa was excavated in 1982-1983 which was found to overlay an earlier timber-framed, though seemingly high-status, courtyard building which was purposely demolished for the construction of the later villa. Little is known of the function of these buildings which were contemporary with the main Palace; their periods of re-development being coincident with that of the Palace itself (Rudkin 1986). Whilst the excavation of these buildings clearly focused on the structures themselves, their presence along the estuary provides evidence of activity in areas next to the harbour and they may be related as such. It is conceivable that either could have provided harbour facilities for incoming vessels into the estuary, though, certainly, people travelling by water to the Palace would have sailed past if not mooring at the villas themselves. This site produced a sizable assemblage which was analysed by French (1986), but I have re-analysed this material to maintain levels of standardisation. Other than these, a range of smaller excavations have taken place, each producing varying quantities of animal bone - I have personally analysed all of these.

Between 1995 and 2002 a final phase of excavation took place immediately to the east of the Palace (Figure 31). A large faunal assemblage was recovered from these and which has been variously published in different reports (Sibun 2003; Sykes 2005; Sykes *et al.* 2006b). Sibun (2003) examined the material from the 1995-1999 assemblage but this was reanalysed in 2004 by White (n.d.) as part of a larger project on the Fishbourne zooarchaeological material (Sykes 2005; Sykes *et al.* 2006b). The dataset for the entire 1995-2002 assemblage was therefore available to me in a format that was compatible with my own, thus rather than re-recording the assemblage once more, these data have been incorporated into my thesis. In total 29,700 fragments of bone have been recorded for the different Fishbourne sites and here I will outline the basic results from the analysis. The data presented in this chapter is the foundation upon which subsequent chapters are built.

It is important to note here that because there is only one context which is securely dated to the Iron Age I would argue that this is too small to make direct chronological comparisons within a traditional economic study of the data. For this reason I have moulded this context with the other very early phases of development at the site. However, to engage in the finer resolution of some of these important features and to examine the 'Iron Age' separately, I will consider the material from this context in detail within Chapter 4 which deals with 'Landscapes of Dwelling'.

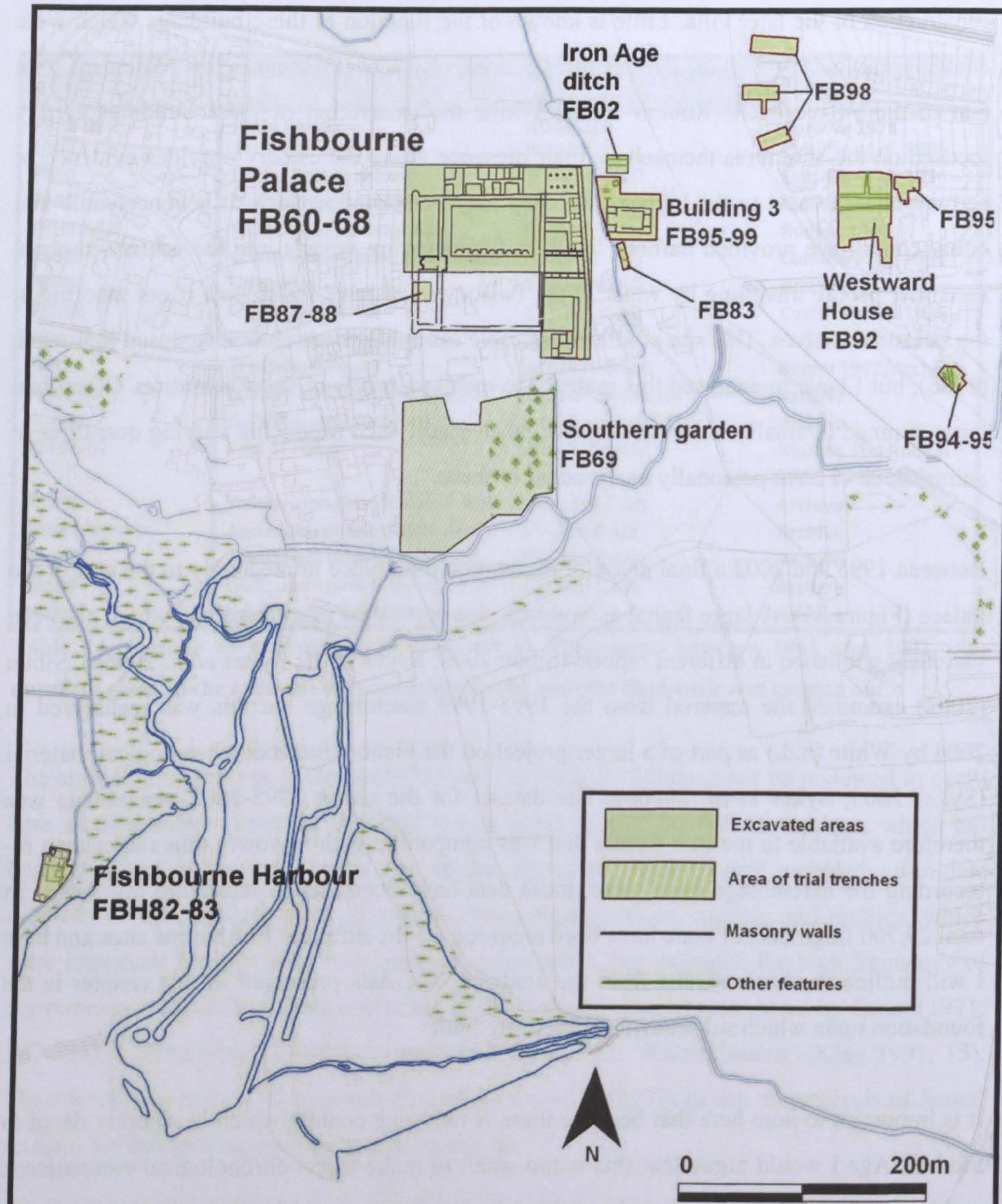


Figure 31; Site plan of major excavations in the Fishbourne environs which have produced significant animal bone assemblages (some Palace plan outlines are conjectural – particularly much of the south wing which remains below the existing A29 and parallel developments); produced by author.

3.4 Recovery and Taphonomic Bias

It is well known that taphonomic processes dramatically impact on animal bone assemblages and assessing faunal assemblages from different excavations as a single entity produce an added dilemma (*cf.* Lyman 1994). As some excavations took place decades apart, material from the 1960s excavations will have incurred around forty years extra curatorial taphonomy, such as breakages that have occurred through post-excavation handling, compared with the material excavated in 2002. Also, different recovery strategies were employed at different times. For example, the 1960s excavations were fully carried out by hand in a process of removing stratified occupational layers (Cunliffe 1971), whereas the 1995-2002 excavations made use of the MoLAS Single Context Planning (SCP) system, dry sieving, environmental floatation and metal detectoring (Manley and Rudkin 2003, 11-12). All the bone fragments from the 1960s excavations were inscribed with contextual information on the surface of the bone and, therefore, only bone fragments with evidence of coding have been analysed. Where codes had clearly eroded, making them difficult to see under normal conditions, UV lighting was employed in a dark room to ascertain the original information. Consequently, every fragment with evidence of coding on its surface has been subject to the fullest analysis possible according to the methods detailed in Chapter 2 to gain as much information about the assemblage as feasible.

Figure 32 shows the frequency of unidentified bone material from the four main excavations around Fishbourne. The assemblages from FBH82-83, FB92 and FB95-02 indicate the relative frequencies of unidentified bone excavated from each are generally similar. The percentages of sheep-sized, cattle-sized, and unidentified bone, taken together, constitute *c.*60-70% of the total material from each assemblage, though with some variation between each of the three categories. FB61-68, however, is significantly different and demonstrates a lack of unidentified remains constituting less than 5% of the total assemblage. This figure is abnormally low for most archaeological assemblages, and it seems likely that the 1960s recovery strategy included the disposal of material deemed 'unidentifiable', probably due to time and storage costs. The relatively high frequency of unidentified small mammal and bird remains concurs with this suggestion indicating that small fragments were being found and kept if considered worthy of study. In the absence of wet sieving from FB61-68, FBH82-83, and FB92, each correlate with the absence of fish remains. However, such differences may also represent spatial differences between the areas of excavation.

It is possible that the positioning of the 1960s excavation over the site of the Palace itself means that the bone assemblage merely represents a greater proportion of fine debris, kitchen and table waste which had been deposited reasonably quickly. Compared to the other three sites, the 1960s assemblage may not have undergone the same taphonomic pathways, such as increased weathering, gnawing, trampling, or differential butchery practices. Therefore, analysis of data collated between different excavations must bear these limitations in mind. However, as the differences produced here focus upon the unidentifiable portion of the assemblages (apart from the fish) it is assumed that the identified portion does not suffer the same degree of difference, and is instead more likely to be affected by inter-observer error generating smaller differences between dataset which are more likely to mitigate over relatively large assemblages. Overall, the animal bone is representative of a relatively large area and is split between various but important foci within the Fishbourne landscape (see Figure 31).

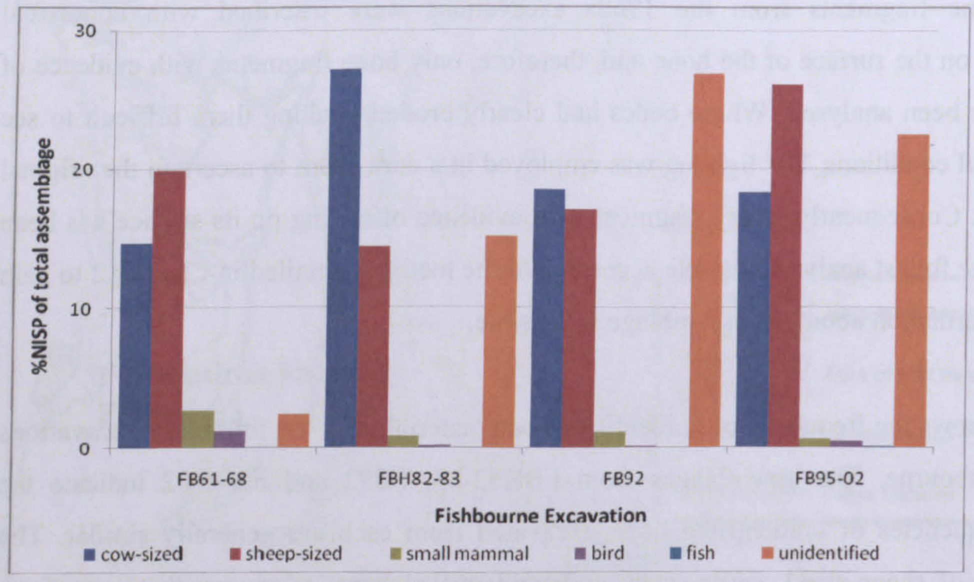


Figure 32; Frequency of material not identified to species from the four main Fishbourne excavations.

There are a total of 50 individual species identified from Fishbourne, a figure that greatly exceeds the low number (usually between six to eight) found on other sites in the local area (Figure 33). Wet sieving strategies employed in more recent excavations at Fishbourne accounts for some of this difference, largely in the number of fish species which were recovered and identified (see also Sykes *et al.* 2006b). At Fishbourne, where wet sieving was used, this increased the number of taxa recovered at a greater proportion than the extra quantity of bone fragments which were produced overall (Figure 34). However, when time-afforded hand collection strategies are in place, specimens of fish, small mammal, and bird are still recoverable, such as the range of bird species excavated from Chichester Cattlemarket (Levitan 1989), the eel from Bignor villa (Armitage *et al.* 1995), and the ballan wrasse from the 1987/88 Fishbourne excavation. The extra number of species represented through sieving does not fully account for the difference in the count of species detected at Fishbourne compared to other sites (Figure 33).

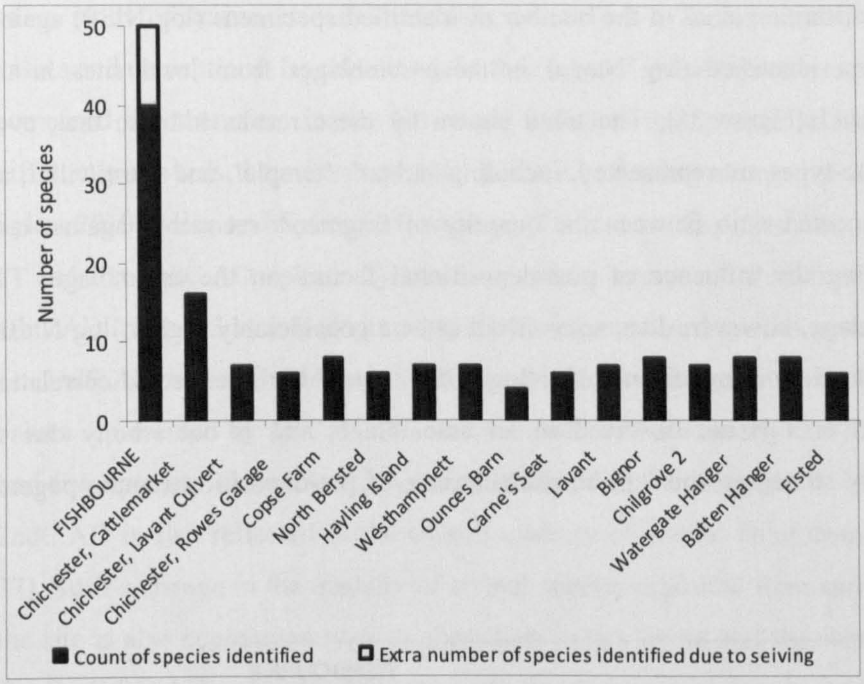


Figure 33; Counts of the number of species identified from Fishbourne and contemporary sites in the sites in the local area. Where 'hybrid' categories are represented, sheep/goat for example, these are counted as 1; where these taxa are also identified in isolation the 'hybrid' category is not included in the count.

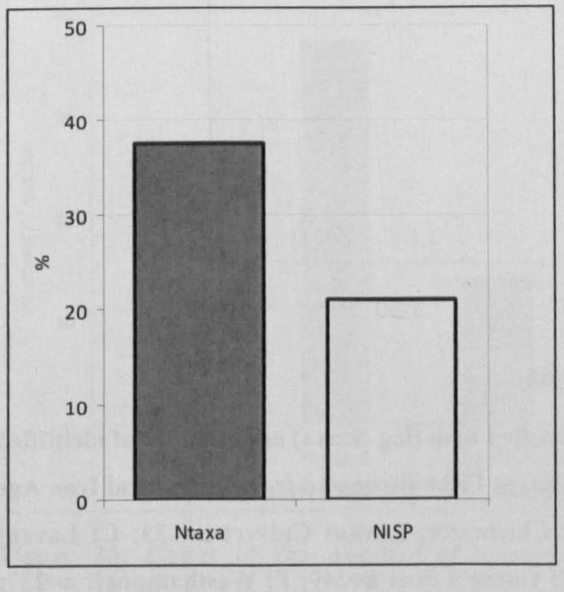


Figure 34; Percentage increase in the number of taxa identified (Ntaxa) compared to the number of fragments (NISP) as a frequency of the total quantities from an assemblage at Fishbourne where wet sieving has been employed. Only data from FBE95-02 excavations used.

It has been repeatedly shown that a general correlation exists between the quantity of bone fragments and the number of taxa identified within a bone assemblage (Reitz and Wing 1999, 146; Simpson *et al.* 1960, 193-201). Such a relationship is demonstrated here by the comparison of logarithmic values of the number of identified specimens (log NISP) against the number of taxa identified (log Ntaxa) in the assemblages from local sites in the Fishbourne hinterland (Figure 35). The trend shown by these results indicate that, even though different site-types are represented, including 'urban', 'temple', and 'farm/villa', all the sites fit an expected ratio between the quantity of fragments recovered against taxa identified, suggesting the influence of post-depositional factors on the assemblage. The Fishbourne assemblage, however, does not – it indicates a considerably higher 'log Ntaxa' value than is expected by comparison to its 'log NISP' value. If the expected correlation between NISP and taxa is not observed in an assemblage, and is not wholly due to differential recovery strategies, this can be characteristic of pre-depositional anthropogenic factors.

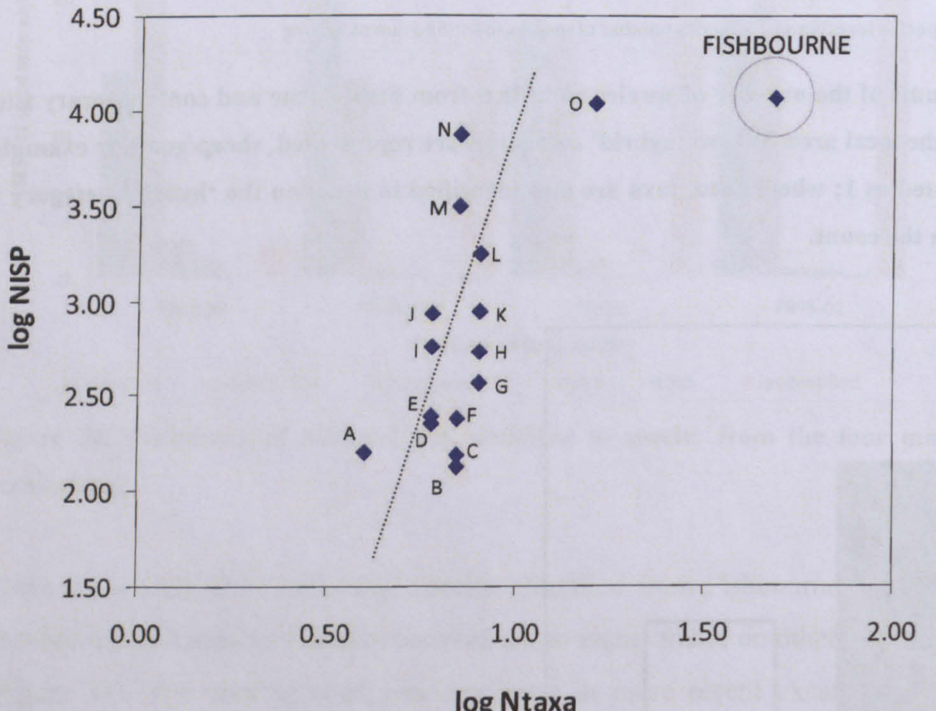


Figure 35; Relationship between number of identified taxa (log Ntaxa) and number of identified fragments (log NISP), both expressed as log ratios, at Fishbourne and from other local Iron Age and Roman sites. A: Ounces Barn n=161; B: Chichester, Lavant Culvert n=133; C: Lavant n=155; D: Chichester, Rowes Garage n=227; E: Carne's Seat n=249; F: Westhampnett n=237; G: Bignor n=365; H: Watergate Hanger n=545; I: North Bersted n=565; J: Elsted n=853; K: Batten Hanger n=882; L: Copse Farm n=1771; M: Chilgrove 2 n=3170; N: Hayling Island n=7452; O: Chichester Cattlemarket n=10769; Fishbourne n=11645 (*n=number of specimens identified to species).

The range of species present in an archaeological sample cannot represent the biodiversity of an environment, only that which was exploited by people. As such it might be better viewed as an index of human-animal interaction, one which is representative of human attitudes, values and perceptions. By this rationale, the range of animal species exploited at Fishbourne compared to other sites in the hinterland indicates that people at Fishbourne are acting differently towards their environment - perhaps reflecting alternative worldviews (see also Sykes 2010; Allen and Sykes forthcoming). The count of species from 1stC.BC-AD (phase 1) and 1st-2ndC.AD (phase 2) however are in excess of that from 2nd-3rdC.AD/3rd-4thC.AD (phases 3 and 4) (Figure 36). The number of bird species greatly reduces after the 1st-2ndC.AD and the evidence for fish exploitation disappears completely. These higher values represented by 1stC.BC-AD and 1st-2ndC.AD are mostly due to an increase in bird and fish species. The greater frequency of bird and fish remains in 1stC.BC-AD and 1st-2ndC.AD is also reflected in the overall quantity of animal bone from each phase (Figure 37). Such a change in the quantity of animal species exploited from early to later periods on the site is also contemporary with alterations in the layout and the status of the settlement. The 1stC.BC-AD coincides with the early development of the site and construction of the 'proto-palace', a structure worthy of any high-status individual or group in early Roman Britain, and 1st-2ndC.AD relates to the construction and maintenance of the main Palace (Figure 9).

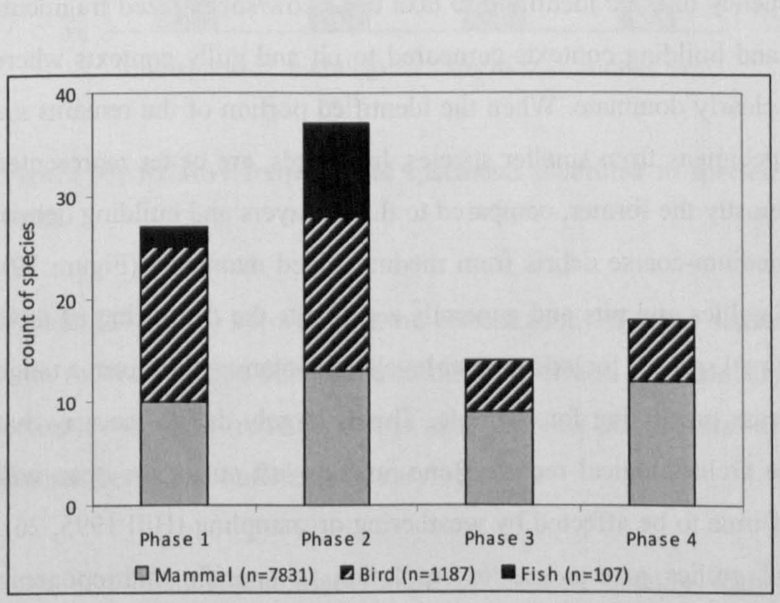


Figure 36; Count of the number of species represented at Fishbourne divided between 'mammal', 'bird', and 'fish' groups by phase. 'Hybrid' categories not included (n=total number of fragments).

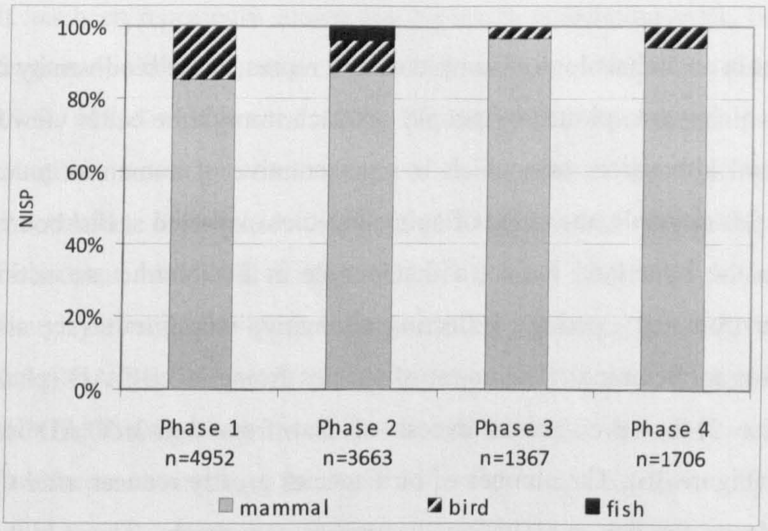


Figure 37; Relative frequency of specimens divided between 'mammal', 'bird', and 'fish' groups by phase (n=total number of fragments). N.B. 5 specimens of fish are represented in 1stC.BC-AD at 0.1%.

It is clear that Fishbourne is an extremely large and complex archaeological site with various areas having developed through different formation processes. As such it would be prudent just to recognise some of the difficulties inherent in contextual analysis which are particular to this site. Taking the excavation FBE02 as a point of focus (see Figure 31) the data from different context type exhibit considerable differences in the character of the bone remains (Figure 38). A greater frequency of bone identified to taxa or as cow/sheep-sized fragments was recovered from layer and building contexts compared to pit and gully contexts where unidentified remains more clearly dominate. When the identified portion of the remains are examined the quantity of specimens from smaller species, hare/birds, are better represented in gullies and pits, though mostly the former, compared to that in layers and building debris, mostly at the expense of medium-coarse debris from medium-sized mammals (Figure 39). Finer debris is a feature of gullies and pits and generally represents the depositing of table waste, whereas the occupational spreads include greater levels of contamination from a range of activities; secondary carcass processing for example. This is largely due to the way that these features formed in the archaeological record. Bone remains left out in the open will have had a greater length of time to be affected by weathering or trampling (Hill 1995, 26). This suggests that pits and gullies give a greater resolution to specific anthropogenic activities. It does not mean, however, that bone remains from layers and building are not useful. Again, the time taken for the deposit to form and become sealed is a factor. Layers immediately beneath the floor level of the Palace would have been sealed and preserved *in situ* relatively quickly, meaning that the layers here are probably more representative of anthropogenic activities than remains in layers away from the Palace.

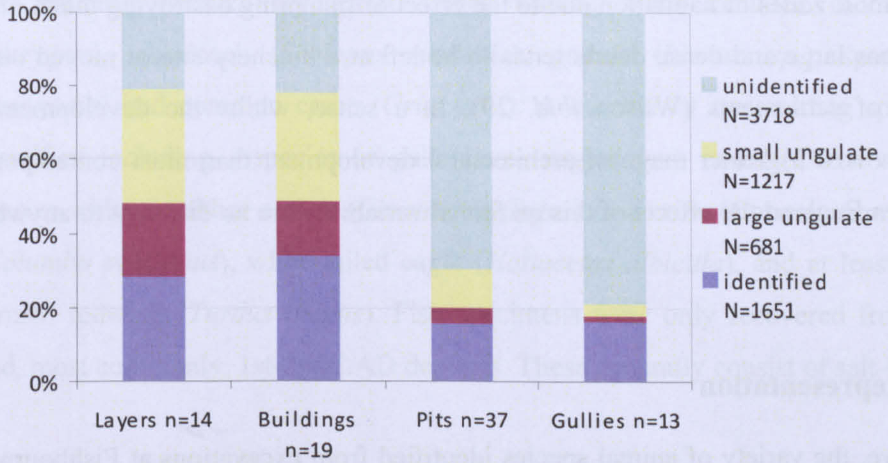


Figure 38; Relative frequency of specimens by identification category from FB02.

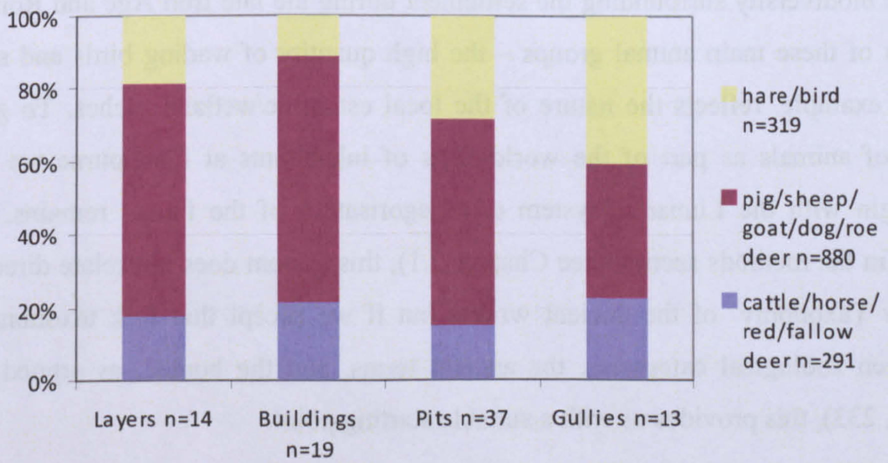


Figure 39; Relative frequency of specimens identified to species, grouped by body size from FB02.

Wilson (1996, 85) showed that the central zones of many settlements are usually associated with medium-coarse debris due to the after-effects of secondary butchery or kitchen/dining activities on the remains. This also applies to species of different size which are dismembered and butchered in varying ways.

> 'Small carcasses could be cooked quickly with a minimum of butchery and a small amount of firewood. Small carcasses bore limited amounts of meat which were not separated from the bones until eating.' (Wilson *ibid.* 28)

Very small bones, however, fish and rodents for example, are generally poorly recovered from the innermost zones of habitation due to the effect of trampling destroying much of the remains, whereas large and dense debris tends to be left at a butchery site or moved out to the periphery of settlements (Wilson *ibid.* 29). In a sense, whilst the development of Fishbourne involved a greater range of architectural development than most contemporary sites in southern England the affects of this on faunal variability are no different to anywhere else.

3.5 Species Representation

As shown above, the variety of animal species identified from excavations at Fishbourne is extensive and there are an approximately equal proportion of taxa represented from mammal, bird and fish groups (Table 15). The range of species recovered from Fishbourne provide an indicator of the biodiversity surrounding the settlement during the late Iron Age and Roman period in terms of these main animal groups – the high quantity of wading birds and salt-water fish, for example, reflects the nature of the local estuarine/wetland niches. To gain understanding of animals as part of the worldviews of inhabitants at Fishbourne we are required to begin with the Linnaean system of categorisation of the faunal remains. As already set out in the methods section (see Chapter 2.1), this system does not relate directly to the 'Literary Taxonomy' of the ancient writers but if we accept that folk taxonomies 'mediate between zoological categories, the ancient terms, and the bones', as argued by Wapnish (1995, 233), this provides us with a suitable starting point.

Mammal species are widely represented in each phase. The main domestic mammals are common, including remains of cat from 1st-2ndC.AD contexts. Goat (*Capra hircus*) remains are identified separately from sheep (*Ovis aries*) within 1stC.BC-AD, 1st-2ndC.AD and 3rd-4thC.AD deposits. Outside the main domesticates, each phase includes three species of cervid and relatively large quantities of hare (*Lepus* sp.). A fox (*Vulpes vulpes*) specimen was identified in 1st-2ndC.AD assemblage as well as two further possible-fox specimens from 1stC.BC-AD and 1st-2ndC.AD phases. Bear (*Ursus* sp.) and badger (*Meles meles*) remains are represented by specimens from 3rd-4thC.AD deposits, and two rat (*Rattus* sp.) specimens were identified from 1st-2ndC.AD contexts. Bird remains were represented in all four phases. Those of domestic fowl were most common, providing the fourth highest quantity of remains for any taxa in 1stC.BC-AD and 1st-2ndC.AD assemblages. Ducks were represented by three Anas species - mallard (*anas platyrhynchus*), teal (*Anas crecca*) and wigeon (*Anas penelope*); two Aythya species - pochard (*Aythya ferina*) and tufted duck (*Aythya fuligula*); and a Melanitta species - velvet scoter (*Melanitta fusca*). Three species of goose were present including greylag (*Anser anser*), pink-footed (*Anser brachyrhynchus*) and barnacle (*Branta leucopsis*). Other wading birds included moorhen (*Gallinula chloropus*), woodcock (*Scolopax rusticola*), godwit (*Limosa sp.*), spoonbill (*Platalea leucorodia*) and common crane (*Grus grus*). A number of non-wading species were also identified including a species of gull (*Larus argentatus*), raven (*Corax corax*), a corvid species which is either a rook (*Corvus frugilegus*) or a crow (*Corvus corone*), woodpigeon (*Columba palumbus*), white-tailed eagle (*Haliaeetus albicilla*), and at least one species of thrush: redwing (*Turdus iliacus*). Fish specimens were only recovered from 1stC.BC-AD and, most commonly, 1st-2ndC.AD deposits. These generally consist of salt-water fish.

Taxa	1stC.BC-AD	1st-2ndC.AD	2nd-3rdC.AD	3rd-4thC.AD	Grand Total
Cattle *Bos Taurus*	842	878	468	559	2747
Sheep/Goat	1078	781	290	364	2513
Sheep *Ovis aries*	8	10	1	2	21
Goat *Capra hircus*	4	6		6	16
Pig *Sus Scrofa*	1857	1173	349	481	3860
Equid *Equus sp.*	58	131	127	63	379
Dog *Canis familiaris*	38	27	18	23	106
Fox *Vulpes vulpes*		1			1
Dog/Fox	1	1			2
Cat *Felis silvestris*		4			4
Red Deer *Cervus elaphus*	151	61	52	68	334
Fallow Deer *Dama dama*	7	17	5	10	39
Fallow Deer/Red Deer	7	1		4	12
Roe Deer *Capreolus capreolus*	101	49	12	17	179
Hare *Lepus europaeus*	70	64	1	7	147
Badger *Meles meles*				2	2
Bear *Ursus arctos*				1	1
Black Rat *Rattus rattus*		2			2
cow-size	1336	1691	660	837	4524
sheep-size	2146	2382	526	864	5918
small mammal	211	187	29	52	479
unidentified mammal	1904	3801	531	656	6892
Domestic Fowl *Gallus sp.*	565	238	37	70	910
Duck *Anas/Aythya sp.*	5	6	1	1	13
Mallard *Anas platyrhynchos*	82	32	3	18	135
Teal *Anas crecca*	4	1			5
Wigeon *Anas penelope*		2			2
Pochard *Aythya ferina*			1		1
Tufted Duck *Aythya fuligula*		1			1
Velvet Scoter *Melanitta fusca*		1			1
Greylag Goose *Anser anser*	25	10	2	7	44
Pink-Footed Goose *Anser brachyrhynchus*	2				2
Barnacle Goose *Branta leucopsis*	2				2
Moorhen *Gallinula chloropus*		3			3
Woodcock *Scolopax rusticola*	2	10			12
Godwit *Limosa sp.*	1				1
Spoonbill *Platalea leucorodia*	1				1
Common Crane *Grus grus*	7	3			10
Gull *Larus argentatus*	11	4			15
Raven *Corvus corax*	1				1
Corvid *Corvus sp.*				1	1
Redwing *Turdus iliacus*		1			1
Thrush *Turdus sp.*	6				6
Woodpigeon *Columba palumbus*	11	3		5	19
White-Tailed Eagle *Haliaeetus albicilla*		1			1
unidentified bird	57	102	5	23	187
Bass *Dicentrarchus labrax*		15			15
Eel *Anguilla anguilla*		17			17
Cod *Gadus morhua*		4			4
Grey Mullet *Mugil cephalus*		5			5
Herring *Clupea harengus*		4			4
Pouting *Trisopterus luscus*		1			1
Seabream *Sparidae sp.*		2			2
Thick-Lipped Mullet *Chelon labrosus*		13			13
Whiting *Merlangius merlangus*		4			4
Ballan Wrasse *Labrus bergylta*	1				1
Flatfish *Pleuronectiformes*	1	55			56
unidentified fish	3	38			41
Grand Total	10606	11828	3118	4141	29700

Table 15, List of taxa identified from Fishbourne. Data produced by NISP from excavations listed in Table 14 by phase as listed in Table 13.

3.6 The Main domesticates

3.6.1 Relative Frequencies

The general trend in composition of Late Iron Age to Roman animal herds has repeatedly been shown to be a sheep to cattle pattern (Maltby 1981; Grant 1989; 2002; Dobney 2001; Albarella 2007; King 1999a; 2001). Variations have also been shown to exist however, in the nature and rate of these changes following the Roman invasion (Grant 1989; 2002; Hamshaw-Thomas 2000). Some areas show quite marked variety in herd composition over quite short distances (Gidney 1999; Albarella 2007) and the Fishbourne hinterland is no different.

The relative frequencies of the three main domesticates at Fishbourne indicate a temporal shift from high pig frequencies in the 1stC.BC-AD and 1st-2ndC.AD towards increasing cattle (Figure 40). During 1stC.BC-AD, pig remains clearly dominate over both cattle and sheep/goats producing nearly 50% of the total remains. Cattle are the least represented domesticate in this phase, producing slightly above 20% of the total. This pattern is similar to other late Iron Age/early Roman elite sites in Britain, particularly oppida, where pig remains tend to dominate (Grant 2002). Whilst there is a shift towards greater cattle frequencies at the expense of pig over time, the frequencies of the two are reasonably similar in 2nd-3rdC.AD/3rd-4thC.AD with cattle slightly the greater around 39-42% whereas pig remains produce *c.*31-34%. In each phase, and despite the apparent pig-cattle shift, sheep/goat remains continue to generate similar frequencies, consistently between 26% and 29%.

The relative frequency of the three domesticates according to MNI calculations is very similar to the NISP results (Figure 41). This also mirrors the trend for a dominant frequency of pigs in the 1stC.BC-AD which gradually decreases over time. Sheep/Goats are slightly better represented by MNI than NISP in each phase, largely at the expense of cattle. This leads to sheep/goats being the best represented domesticate in 3rd-4th centuries, though the frequencies are approximately equal overall between each taxa in both 2nd-3rd centuries and 3rd-4th centuries.

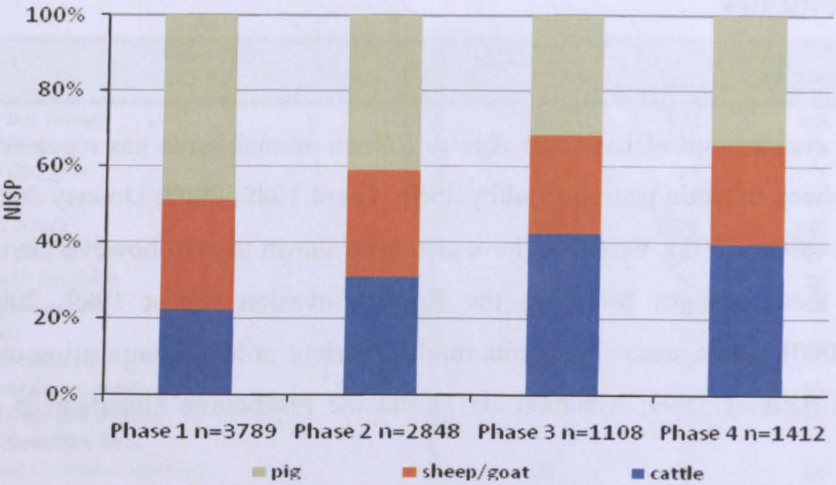


Figure 40; Relative frequency of cattle, sheep/goat and pig from Fishbourne by phase from the number of identified specimens.

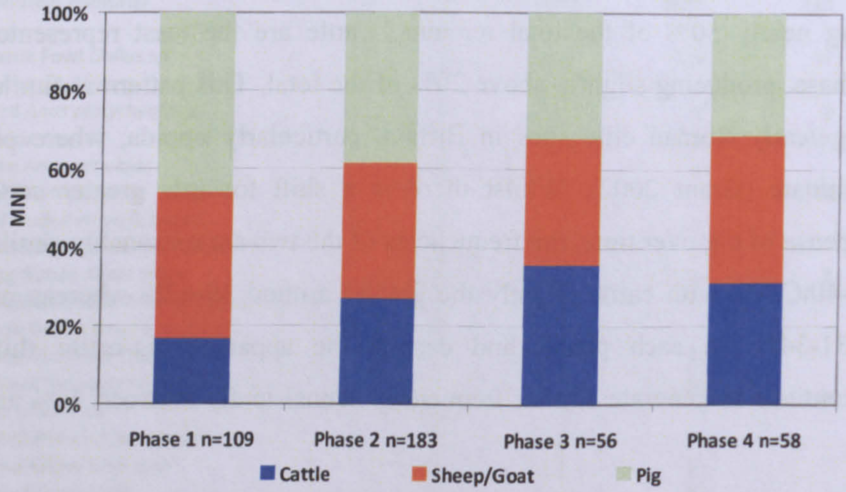


Figure 41; Relative frequency of cattle, sheep/goat and pig from Fishbourne by phase from the minimum number of individuals.

The relative frequency of cattle, sheep/goat and pigs at Fishbourne indicate quite different patterns in 1stC.BC-AD and 1st-2nd centuries AD to other sites in the hinterland (Figure 42). Late Iron Age farmstead sites at Copse Farm and North Bersted include far fewer pig remains than at Fishbourne and instead produced faunal assemblages with more equal frequencies of cattle and sheep/goat remains. In Phase two, the patterns are relatively similar to 1stC.BC-AD. The assemblage from Copse Farm shifts from a one based on both cattle and sheep/goat to one dominated by cattle remains. This may indicate some reorganisation of the site in local farming regime. One site with a considerably different faunal assemblage to the local trends is the late Iron Age temple site at Hayling Island which produced large quantities of sheep/goat and pig remains and an almost complete absence of cattle. Cattle remains were completely absent from within the 'sacred' part of the complex which produced entirely the remains of the first two animals (King and Soffe 2001, 120). The frequencies of main domesticate at Hayling Island continued into Phase three with a slight increase in pig remains at the expense of sheep/goat.

Other than at Hayling Island, cattle remains are present in the greatest relative frequencies on all sites in 2nd-3rd centuries/3rd-4th centuries. Cattle remains at Fishbourne are still lower than at all other sites in the hinterland which regularly indicate frequencies of cattle greater than 50%, and as high as nearly 80% at the late Roman villa at Bignor. On most sites other than Fishbourne, pig remains are generally recovered in minimal quantities; a pattern which suggests that they continued to embody a high social value compared to, probably both, cattle and sheep. The higher frequency of pig remains by comparison at Fishbourne seems to have continued as a statement of economic power in the ability of the inhabitants to have so many animals of high value killed and consumed in favour of the more common cattle and sheep.

Whilst cattle tend to produce the majority of remains from most sites in the area the chronological pattern tends to follow the national trend of increasing cattle at the expense of sheep/goats. As shown in the Fishbourne assemblages, cattle are better represented in 2nd-3rd centuries and 3rd-4th centuries. The inference of high cattle frequencies at smaller rural sites and high pig frequencies at Fishbourne promote the view that we are dealing with cattle farms against a site which was predominantly consuming pork and did not keep much in the way of livestock. This is unlikely to have been the case in reality. Bone sample sizes are always generally low from small rural sites, never reaching 1000 fragments, at least until the villas of the late Roman period. Smaller numbers of cattle, sheep and goats may well have been kept at these sites on a subsistence/local market level. One suggestion might be that animals, whilst important at small rural sites were far more important as living creatures than they were for food. Only at Fishbourne (Palace), Chichester (urban), and Hayling Island (temple) were larger quantities of animal bones recovered.

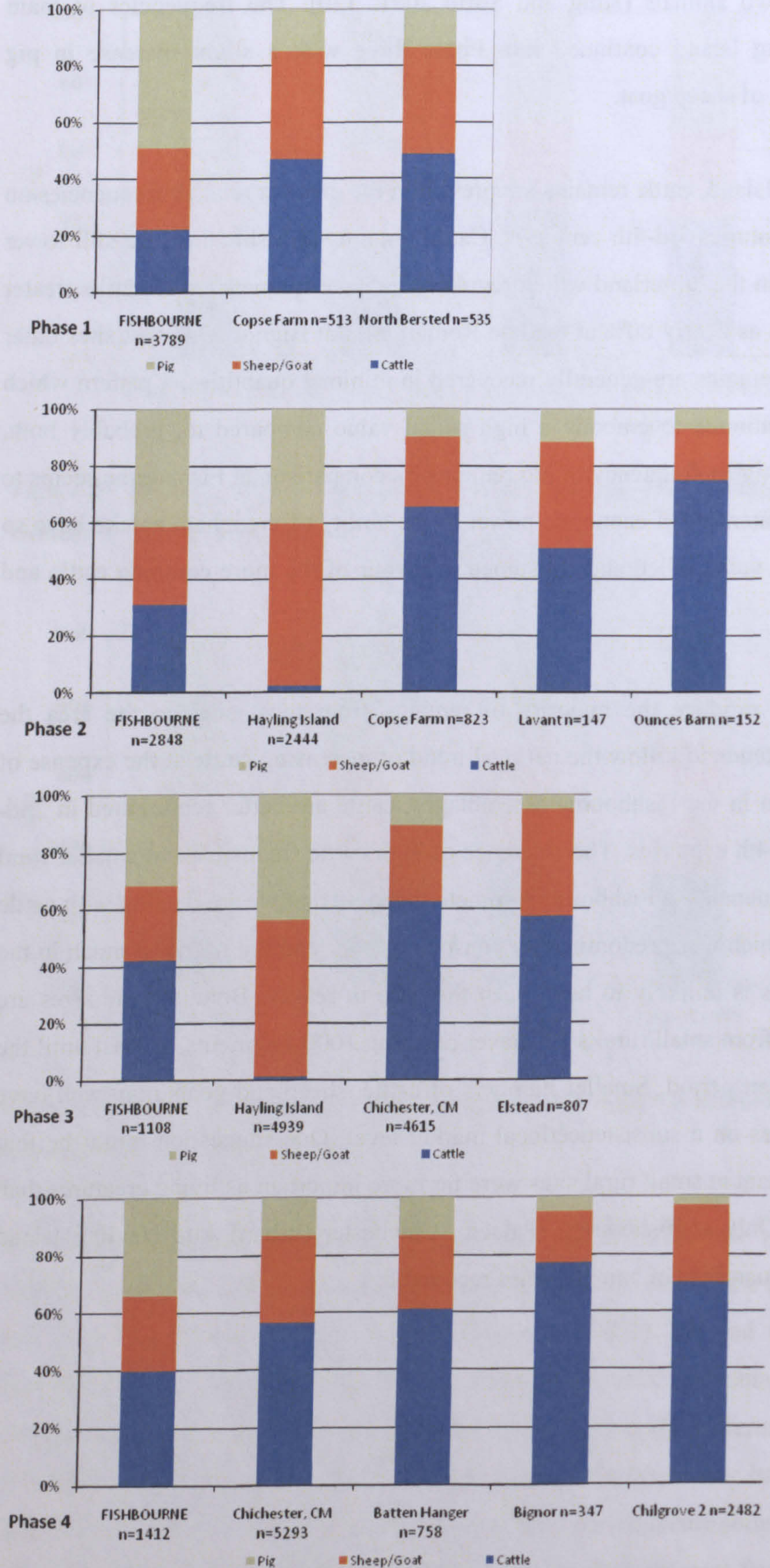


Figure 42; Relative frequency of cattle, sheep/goat, and pig from Fishbourne hinterland sites by phase.

3.6.2 Ageing through Time and Space

3.6.2.1 Sheep and Goats

Most of the phases at Fishbourne contained sheep/goats of a wide variety of ages in most phases. Very young individuals are present in Phases 1 – 3 with 1st-2ndC.AD deposits including stage A specimens (foetal/neonatal) and all three producing stage B specimens (*c.* 1-3months). In 1stC.BC-AD the majority of specimens were present in similar frequencies between MWS C and G (Figure 43a). In 1st-2nd centuries AD this pattern shifted towards a less restricted peak in specimens between D and F though the entire range of age groups is present in this Phase (Figure 43b). The presence of samples at stages A and B, as well as at H and J, suggest that a full breeding flock was present at the site in this phase. 2nd-3rdC.AD is similar to the preceding phase with a corresponding age profile curve, though there is an absence of specimens from older animals (MWS H and J) in this phase. This could be a result of the reduced sample size from 1st-2nd centuries AD, and in fact the existence of onsite breeding and rearing of lambs had continued. By 3rd-4th centuries the pattern of dominant age range between D – F had continued, though the overall pattern had shifted from younger animals to older sheep/goats with an absence of yearling lambs and samples at stage H.

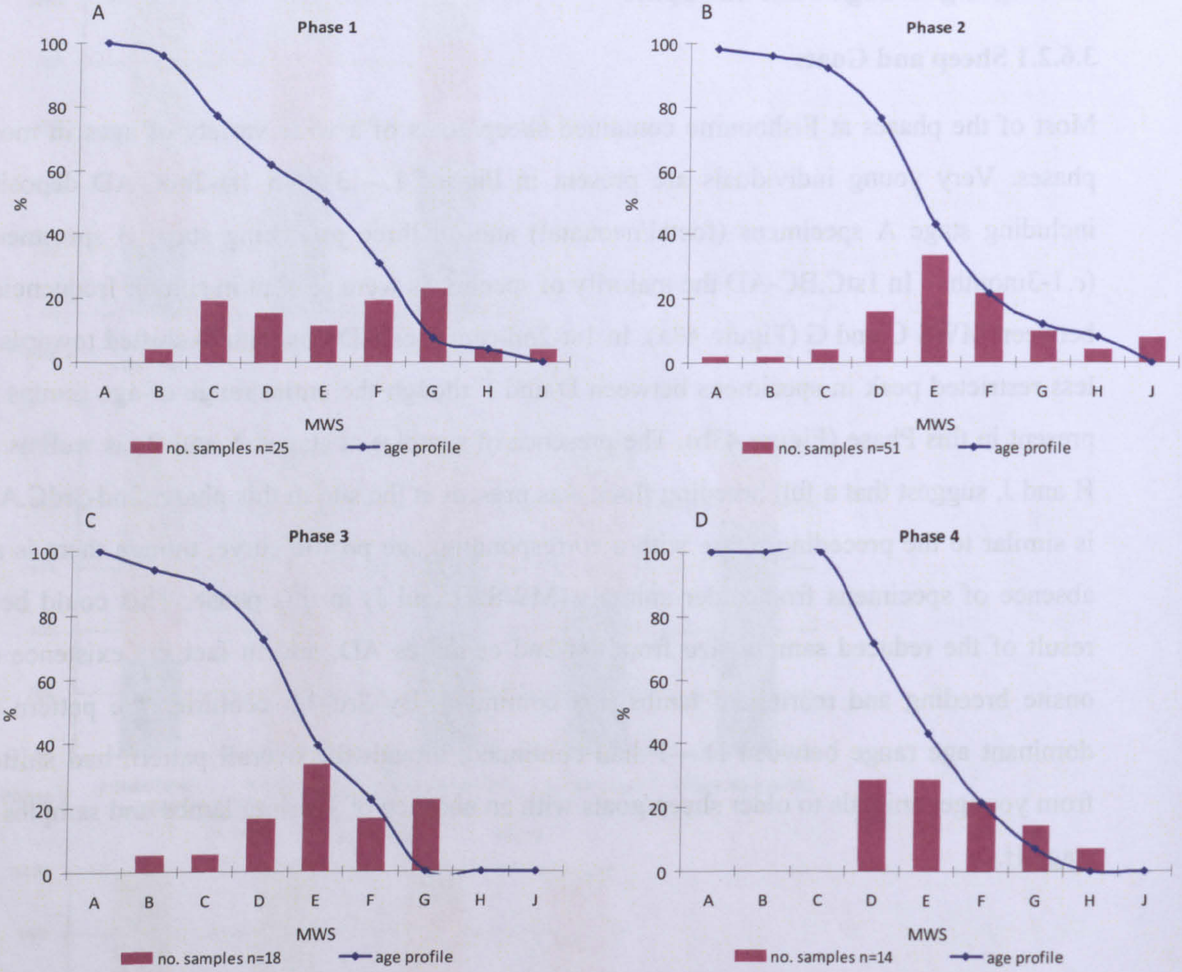


Figure 43 a-d; Dental age profiles for sheep/goat specimens from Fishbourne by phase.

A: 1stC.BC-AD

Age at Fusion	Element	F	UF	Total	%F
3-4 months	D.humerus	20	18	38	
	P.radius	8	6	14	
	Total	28	24	52	53.8
5-7 months	scapula	11	1	12	
	pelvis	1	3	4	
	phalanx II	2	1	3	
	Total	14	5	19	73.7
7-10 months	phalanx I	8	1	9	
	Total	8	1	9	88.9
15-20 months	D.tibia	31	13	44	
	Total	31	13	44	70.5
20-24 months	D.metacarpal	9	3	12	
	D.metatarsal	10	6	16	
	Total	19	9	28	67.9
36-42 months	calcaneum	8	4	12	
	P.femur	3	3	6	
	Total	11	7	18	61.1
42 months	D.femur	1	0	1	
	P.humerus	1	7	8	
	D.radius	1	10	11	
	P.tibia	1	8	9	
	ulna	4	1	5	
	Total	8	26	34	23.5

B: 1st-2ndC.AD

Age at Fusion	Element	F	UF	Total	%F
3-4 months	D.humerus	27	26	53	
	P.radius	18	14	32	
	Total	45	40	85	52.9
5-7 months	scapula	14	7	21	
	pelvis	1	5	6	
	phalanx II	3	0	3	
	Total	17	12	29	58.6
7-10 months	phalanx I	36	0	36	
	Total	36	0	36	100.0
15-20 months	D.tibia	48	15	63	
	Total	48	15	63	76.2
20-24 months	D.metacarpal	18	13	31	
	D.metatarsal	12	15	27	
	Total	30	28	58	51.7
36-42 months	calcaneum	10	8	18	
	P.femur	4	10	14	
	Total	14	18	32	43.8
42 months	D.femur	1	14	15	
	P.humerus	1	16	17	
	D.radius	9	16	25	
	P.tibia	1	14	15	
	ulna	3	9	12	
	Total	15	69	84	17.9

C: 2nd-3rdC.AD

Age at Fusion	Element	F	UF	Total	%F
3-4 months	D.humerus	5	4	9	
	P.radius	3	0	3	
	Total	8	4	12	66.7
5-7 months	scapula	6	1	7	
	pelvis	1	0	1	
	phalanx II	1	0	1	
	Total	8	1	9	88.9
7-10 months	phalanx I	5	2	7	
	Total	5	2	7	71.4
15-20 months	D.tibia	9	2	11	
	Total	9	2	11	81.8
20-24 months	D.metacarpal	2	1	3	
	D.metatarsal	5	2	7	
	Total	7	3	10	70.0
36-42 months	calcaneum	2	1	3	
	P.femur	0	2	2	
	Total	2	3	5	40.0
42 months	D.femur	0	1	1	
	P.humerus	0	3	3	
	D.radius	3	2	5	
	P.tibia	0	1	1	
	ulna	1	2	3	
	Total	4	9	13	30.8

D: 3rd-4thC.AD

Age at Fusion	Element	F	UF	Total	%F
3-4 months	D.humerus	3	6	9	
	P.radius	7	0	7	
	Total	10	6	16	62.5
5-7 months	scapula	4	0	4	
	pelvis	2	0	2	
	phalanx II	0	0	0	
	Total	6	0	6	100.0
7-10 months	phalanx I	7	1	8	
	Total	7	1	8	87.5
15-20 months	D.tibia	6	6	12	
	Total	6	6	12	50.0
20-24 months	D.metacarpal	4	3	7	
	D.metatarsal	8	2	10	
	Total	12	5	17	70.6
36-42 months	calcaneum	1	1	2	
	P.femur	0	2	2	
	Total	1	3	4	25.0
42 months	D.femur	1	3	4	
	P.humerus	1	4	5	
	D.radius	4	1	5	
	P.tibia	1	2	3	
	ulna	2	2	4	
	Total	9	12	21	42.9

Table 16 a-d; Epiphyseal fusion data for sheep/goat remains from Fishbourne by phase.

The presence of very young sheep/goat is certainly indicated by the epiphyseal fusion data for the site, particularly in 1stC.BC-AD and 1st-2nd centuries AD (Table 16). Relatively high frequencies of distal humeri and proximal radii were identified prior to fusing: an event which takes place for these elements around 3-4 months of age (*cf.* Getty 1975). These data are reinforced by the presence of a number of unfused elements at the 5-7 months stage also. This pattern, whilst present in 2nd-3rd centuries/3rd-4th centuries, is not as marked as in the first two phases. This may be a result of the smaller sample size however as neonatal and juvenile bones will be more prone to damage than older specimens and so will survive and be recovered at a lower rate. Whilst most of the sheep/goat specimens can only be identified to both these species the identification of a neonatal goat mandible from 1stC.BC-AD deposits indicates that both sheep and goats were being bred and reared onsite (Figure 44). The epiphyseal fusion data complements the dental ageing data by showing a relatively high frequency of young animals, with an indication of a slight shift in emphasis in the later phase of allowing more animal to survive to older ages. Overall, the dental age profiles for each phase are generally similar for each phase, suggesting the continuation of sheep/goat husbandry practices over time.

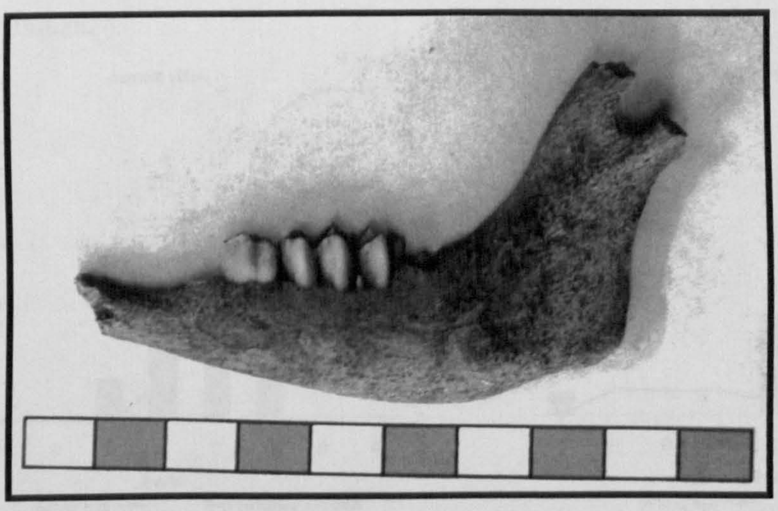


Figure 44; Mandible specimen from a neonatal goat (*c.*AD43-75). Note the small 'notch' at the base of the 4th deciduous premolar between the 2nd and 3rd cusps – this diagnostic feature is absent in deciduous sheep teeth.

Data from the other sites in the hinterland suggest a variety of different sheep/goat husbandry practices were evident. However, sample sizes for other sites are generally smaller than those recorded from Fishbourne. The late Iron Age phases from the farmsteads at North Bersted and Copse Farm, and the enclosure site at Carne's Seat each display different characteristics. North Bersted is dominated by specimens at stage E indicating a high degree of selectivity of this particular age group. Copse Farm, on the contrary, is dominated by very young animals, equally representative between age stages B – E. The assemblage from Carne's Seat is the smallest sample though two neonatal sheep mandibles at stage B are present along with specimens from older animals, stages G and H, with a virtual absence of animals between the two age groups.

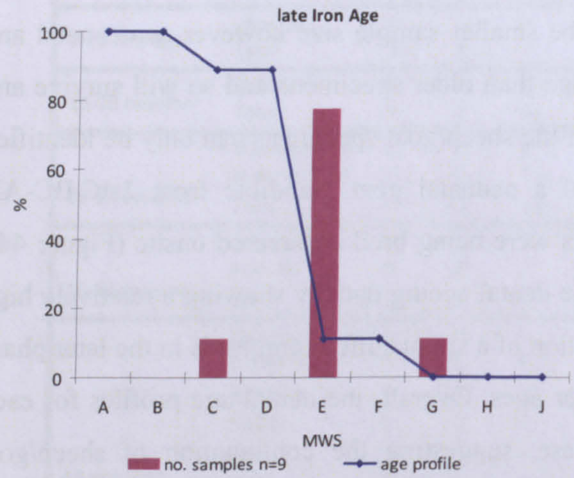


Figure 45; Dental age profile for sheep/goats from North Bersted (late Iron Age).

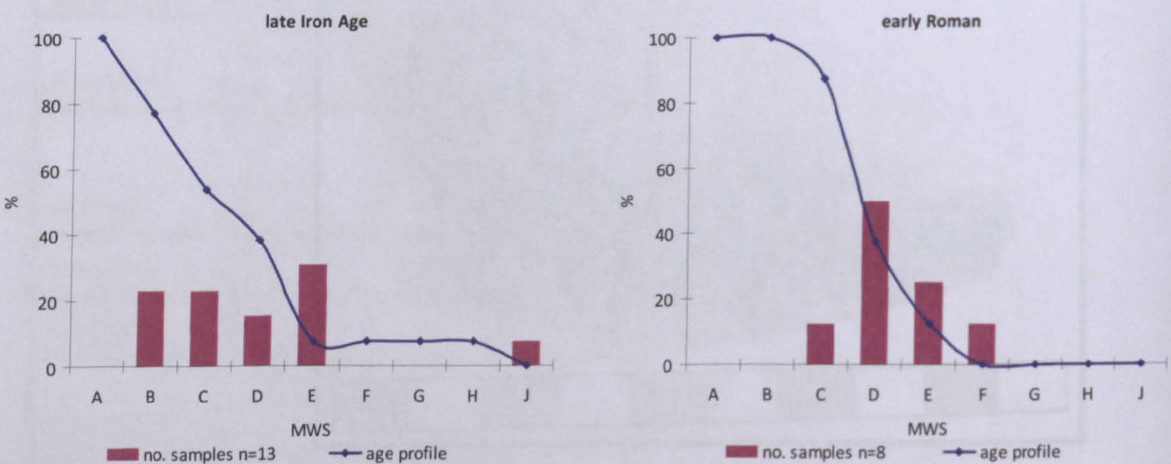


Figure 46; Dental age profiles for sheep/goats from Copse Farm. Left: late Iron Age; right: early Roman.

The inference from the data of these Iron Age sites is that each played a particular role in the local animal economy. Whilst the high status site at Fishbourne was able to remain subsistent and control its own flocks the other three may have been involved in separate but complimentary activities. The selectivity of stage E sheep/goats at North Bersted is suggestive of a consumer site solely bringing animals in for slaughter for meat. The Copse Farm data show little in the way of selectivity but the concentration on young animals may suggest a site concerned with rearing young, though the absence of older animals means that a system of flock movement may have been in place. Older animals certainly are present at the enclosure site at Carne's Seat and the isolated presence of a couple of very young lambs hint at a site which was seasonally occupied, late spring/summer during the late Iron Age. One can envisage a system of transhumance of animals being reared on sites on the coastal plain and being moved to the downs for summer pasturage.

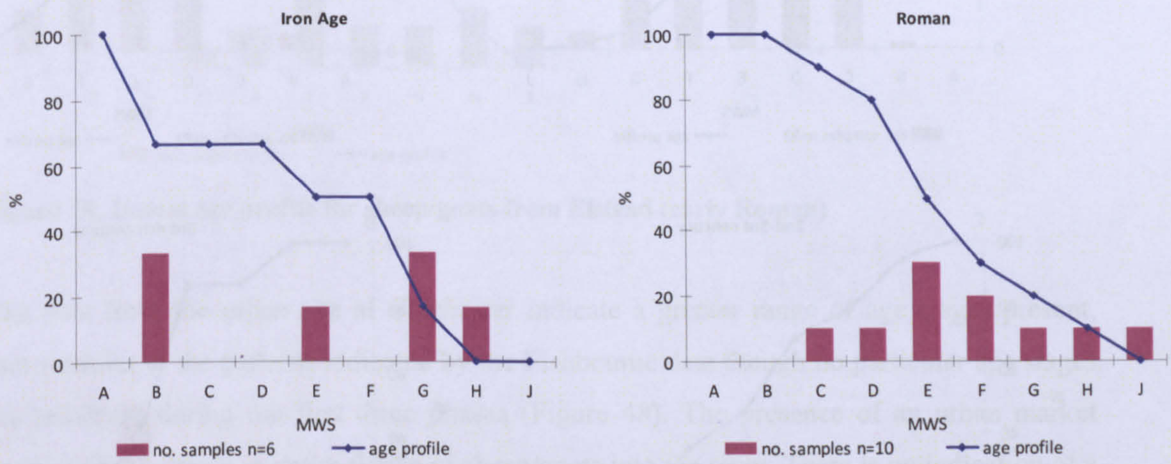


Figure 47; Dental age profile for sheep/goats from Carne's Seat. Left: late Iron Age; right: early Roman.

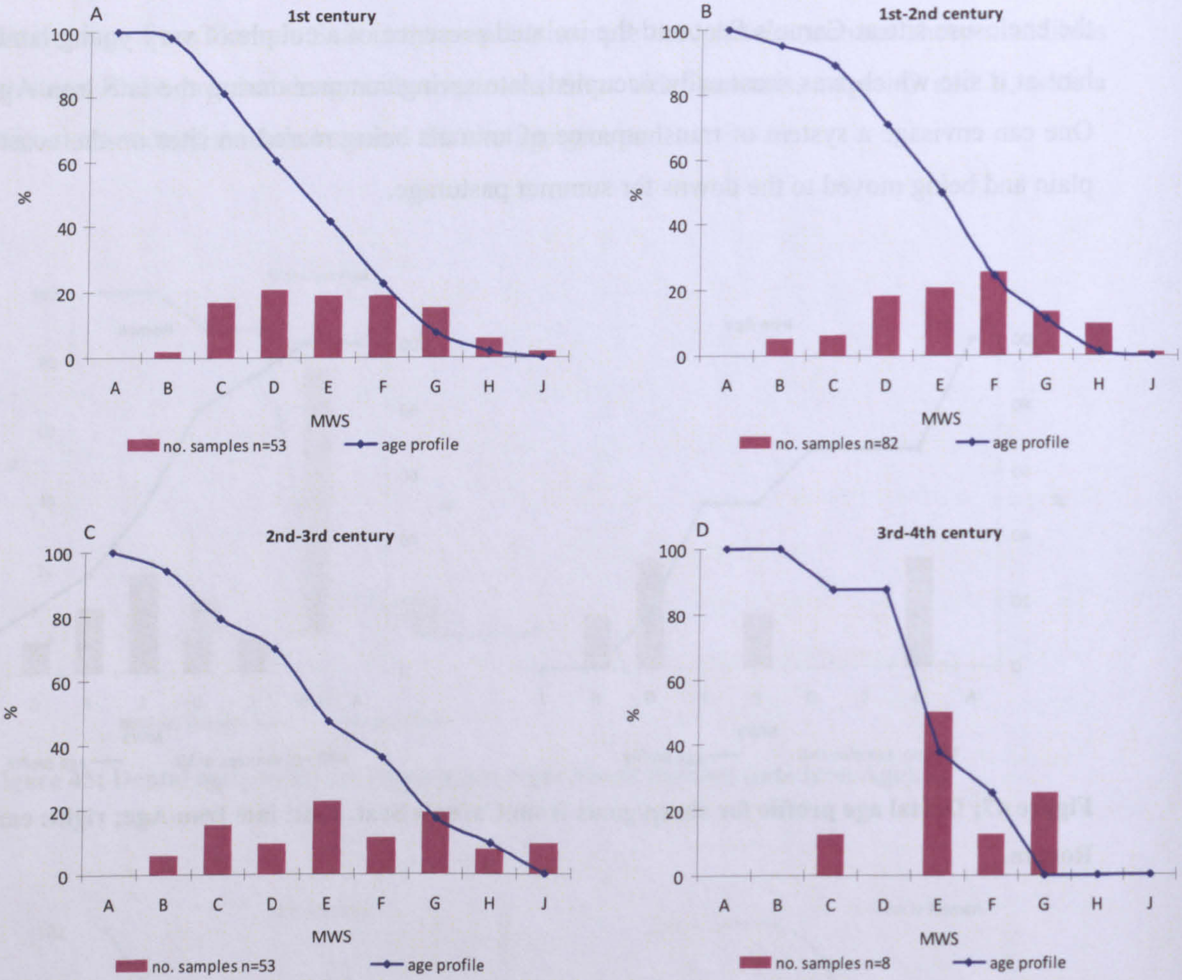


Figure 48 a-d; Dental age profiles for sheep/goat specimens from Chichester Cattlemarket by phase.

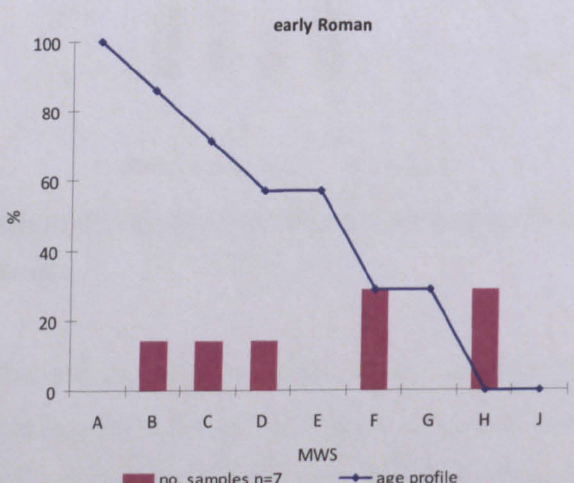


Figure 49; Dental age profile for sheep/goat specimens from Lavant (early Roman).

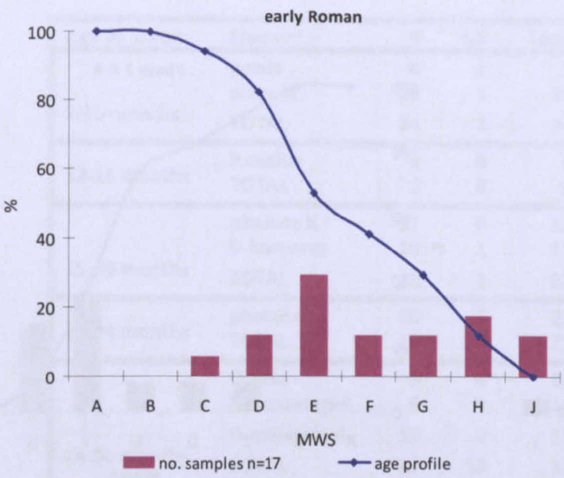


Figure 50; Dental age profile for sheep/goats from Elstead (early Roman)

The data from the urban site at Chichester indicate a greater range of age stages present, more similar to the patterns indicated by the Fishbourne data though no particular age stages are prevalent during the first three phases (Figure 48). The presence of an urban market seems to have drawn in entire flocks of sheep/goats into the town. There is no indication of a specialised economy from the Chichester ageing data but rather all parts of the flock brought in for a variety of reasons. The Roman period rural sites also tend to show greater ranges of sheep/goat ages present on site. The early Roman phase at Copse Farm indicates a shift towards older animals compared with its late Iron Age counterpart, where as Lavant, Carne's Seat, and Elstead each produced sheep/goat age ranges from B/C to H/J. The move from the Iron Age to the Roman period seems to have been, economically, one changing from a co-operative system of flock management towards a more independent arrangement where each site reared and maintained its own flock. Whilst the sample sizes are small and, therefore, the interpretation tentative, the development of the local urban economy and the pattern of onsite breeding manage at Fishbourne could well have driven such a change.

3.6.2.2 Cattle

The cattle ageing data from Fishbourne shows two different patterns of husbandry from 1stC.BC-AD and 1st-2nd centuries to 2nd-3rd centuries and 3rd-4th centuries (Figure 51). Both show wide ranges in age stage, though in 1stC.BC-AD and 1st-2nd centuries the emphasis is on younger animals compared with the latter phases where there is a greater frequency of older animals. The later phase also lacks specimens from stage A and B although the sample size is smaller. Whilst most age ranges are present in both periods the difference in husbandry regime can be observed in the age profile, where the earlier one decreases relatively more cattle survive to older ages in the latter.

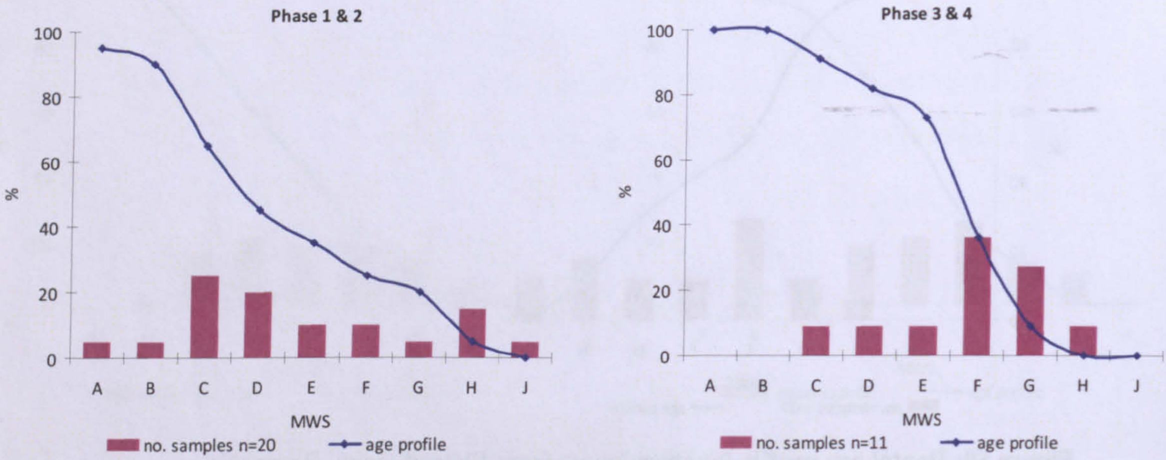


Figure 51; Dental ageing data for cattle from Fishbourne. Left: 1stC.BC-AD & 1st-2ndC.AD; right: 2nd-3rdC.AD & 3rd-4thC.AD.

The epiphyseal fusion data are not as significantly different by comparison to the dental ageing data (Table 17). In each phase greater than 90% of the population tend to survive at least to 2 years of age. In 3rd-4th centuries there is an absence of unfused cattle specimens prior to 15 months of age. However a greater proportion of cattle tend to survive after this age in the later phases. The general pattern from Fishbourne is very different from the rural site at Copse Farm, however, where the emphasis is firmly on older stock. The pattern of cattle ageing from this site is similar in both the late Iron Age and Roman phases. There are no specimens from stages A to C at either phase from Copse Farm and it seems unlikely that any breeding of animals took place at this site but seem to have been imported. The data from Chichester Cattlemarket also has an emphasis on older animals with relatively few examples of young animals (Figure 53). These seem likely to have been animals brought in from rural areas to be traded in the town. From the data currently at our disposal only Fishbourne shows any evidence of cattle breeding and rearing.

A: 1stC.BC-AD

Age at fusion	Element	F	UF	Total	%F
7-10 months	pelvis	4	1	5	
	scapula	20	1	21	
	TOTAL	24	2	26	92.3
12-15 months	P.radius	6	0	6	
	TOTAL	6	0	6	100.0
15-20 months	phalanx II	11	0	11	
	D.humerus	10	1	11	
	TOTAL	21	1	22	95.5
20-24 months	phalanx I	20	1	21	
	TOTAL	20	1	21	95.2
24-30 months	D.tibia	8	4	12	
	D.metacarpal	6	4	10	
	D.metatarsal	13	2	15	
	TOTAL	27	10	37	73.0
30-36 months	calcaneum	11	3	14	
	TOTAL	11	3	14	78.6
36-42 months	P.femur	2	3	5	
	TOTAL	2	3	5	40.0
42-48 months	P.humerus	1	3	4	
	D.radius	3	3	6	
	ulna	0	1	1	
	D.femur	1	2	3	
	P.tibia	5	3	8	
	TOTAL	10	12	22	45.5

B: 1st-2ndC.AD

Age at fusion	Element	F	UF	Total	%F
7-10 months	Pelvis	4	2	6	
	scapula	39	1	40	
	TOTAL	43	3	46	93.5
12-15 months	P.radius	16	1	17	
	TOTAL	16	1	17	94.1
15-20 months	phalanx II	43	1	44	
	D.humerus	7	2	9	
	TOTAL	50	3	53	94.3
20-24 months	phalanx I	124	7	131	
	TOTAL	124	7	131	94.7
24-30 months	D.tibia	16	1	17	
	D.metacarpal	45	8	53	
	D.metatarsal	48	22	70	
	TOTAL	107	31	138	77.5
30-36 months	calcaneum	6	3	9	
	TOTAL	6	3	9	66.7
36-42 months	P.femur	3	3	6	
	TOTAL	3	3	6	50.0
42-48 months	P.humerus	2	1	3	
	D.radius	6	1	7	
	ulna	1	1	2	
	D.femur	5	5	10	
	P.tibia	0	5	5	
	TOTAL	14	13	27	51.9

C: 2nd-3rdC.AD

Age at fusion	Element	F	UF	Total	%F
7-10 months	pelvis	3	2	5	
	scapula	13	0	13	
	TOTAL	16	2	18	88.9
12-15 months	P.radius	6	1	7	
	TOTAL	6	1	7	85.7
15-20 months	phalanx II	16	0	16	
	D.humerus	8	1	9	
	TOTAL	24	1	25	96.0
20-24 months	phalanx I	33	1	34	
	TOTAL	33	1	34	97.1
24-30 months	D.tibia	6	1	7	
	D.metacarpal	11	3	14	
	D.metatarsal	15	2	17	
	TOTAL	32	6	38	84.2
30-36 months	calcaneum	7	2	9	
	TOTAL	7	2	9	77.8
36-42 months	P.femur	0	4	4	
	TOTAL	0	4	4	0.0
42-48 months	P.humerus	1	0	1	
	D.radius	4	1	5	
	ulna	0	0	0	
	D.femur	1	2	3	
	P.tibia	0	0	0	
	TOTAL	6	3	9	66.7

D: 3rd-4thC.AD

Age at fusion	Element	F	UF	Total	%F
7-10 months	pelvis	0	0	0	
	scapula	19	0	19	
	TOTAL	19	0	19	100.0
12-15 months	P.radius	7	0	7	
	TOTAL	7	0	7	100.0
15-20 months	phalanx II	11	0	11	
	D.humerus	15	3	18	
	TOTAL	26	3	29	89.7
20-24 months	phalanx I	31	3	34	
	TOTAL	31	3	34	91.2
24-30 months	D.tibia	6	2	8	
	D.metacarpal	11	5	16	
	D.metatarsal	16	4	20	
	TOTAL	33	11	44	75.0
30-36 months	calcaneum	3	1	4	
	TOTAL	3	1	4	75.0
36-42 months	P.femur	3	1	4	
	TOTAL	3	1	4	75.0
42-48 months	P.humerus	0	1	1	
	D.radius	3	2	5	
	ulna	1	1	2	
	D.femur	1	2	3	
	P.tibia	1	1	2	
	TOTAL	6	7	13	46.2

Table 17 a-d; Epiphyseal fusion data for cattle remains from Fishbourne by phase.

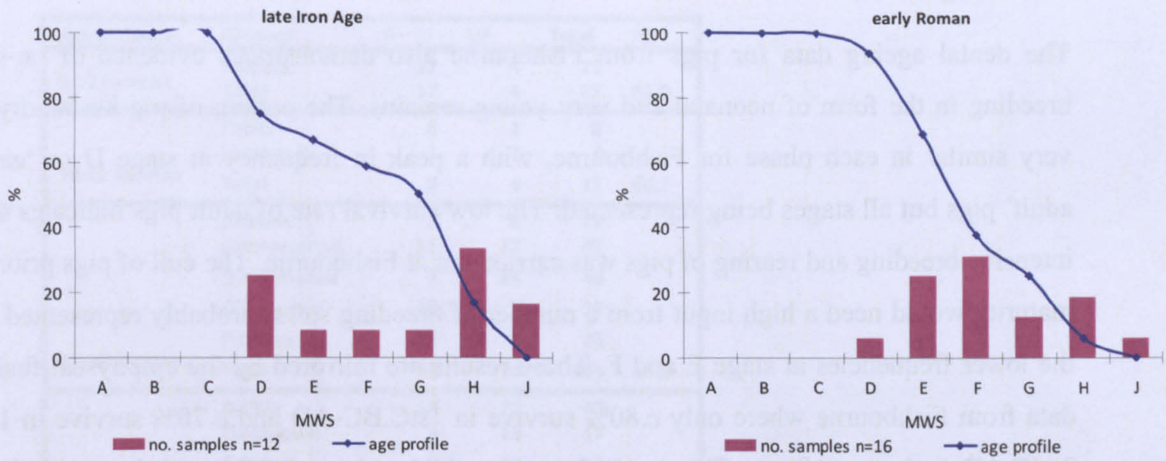


Figure 52; Dental ageing data for cattle from Copse farm. Left: late Iron Age; right: Roman.

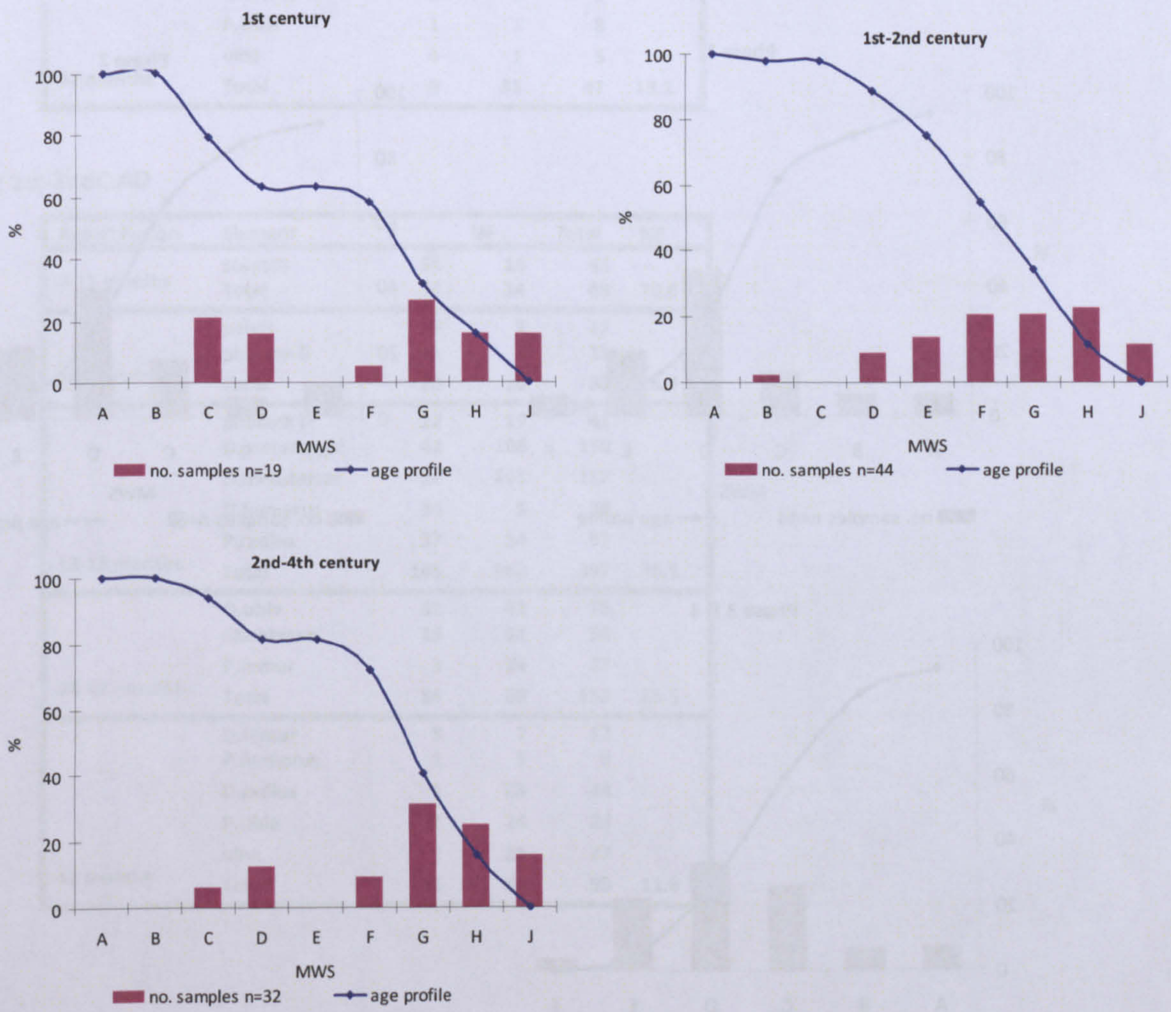


Figure 53; Dental ageing data for cattle from Chichester Cattlemarket. Top left: 1st century AD; top right: 1st-2nd century; bottom left: 2nd-4th century.

3.6.2.3 Pigs

The dental ageing data for pigs from Fishbourne also demonstrates evidence of on-site breeding in the form of neonatal and very young remains. The pattern of pig husbandry is very similar in each phase for Fishbourne, with a peak in frequency at stage D or 'early adult' pigs but all stages being represented. The low survival rate of adult pigs indicates that intensive breeding and rearing of pigs was carried out at Fishbourne. The cull of pigs prior to maturity would need a high input from a number of breeding sows, probably represented by the lower frequencies at stage E and F. These results are mirrored by the epiphyseal fusion data from Fishbourne where only *c.*80% survive in 1stC.BC-AD and *c.*70% survive in 1st-2ndC.AD to 1 year of age. The survival rate to adulthood is minimal and decreases from 1stC.BC-AD to 3rd-4thC.AD with only *c.*5% of pig remaining in the latter.

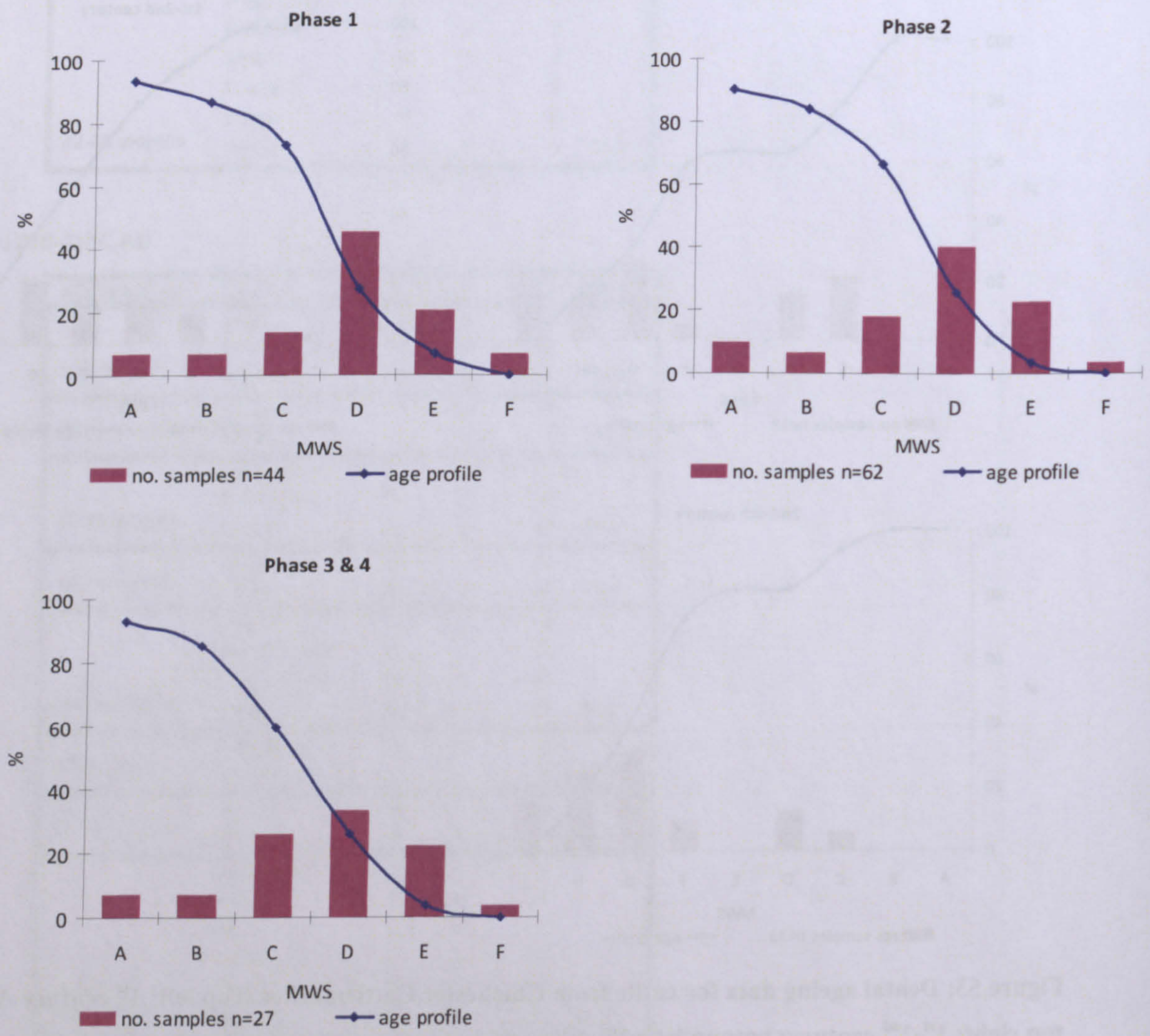


Figure 54; Ageing data for pigs from Fishbourne. Top left: 1stC.BC-AD; top right: 1st-2ndC.AD; bottom left: 2nd-3rdC.AD & 3rd-4thC.AD.

A: 1stC.BC-AD

Age at Fusion	Element	F	UF	Total	%F
9-12 months	Scapula	17	4	21	
	Total	17	4	21	81.0
10-12 months	Pelvis	6	2	8	
	phalanx II	2	2	4	
	Total	8	4	12	66.7
12-18 months	phalanx I	7	6	13	
	D.metacarpal	15	27	42	
	D.metatarsal	7	33	40	
	D.humerus	18	7	25	
	P.radius	22	1	23	
	Total	69	74	143	48.3
24-42 months	D.tibia	18	22	40	
	Calcaneum	4	13	17	
	P.femur	0	13	13	
	Total	22	48	70	31.4
42 months	D.femur	2	16	18	
	P.humerus	2	9	11	
	D.radius	0	5	5	
	P.tibia	1	7	8	
	ulna	4	1	5	
	Total	9	38	47	19.1

B: 1st-2ndC.AD

Age at Fusion	Element	F	UF	Total	%F
9-12 months	scapula	34	14	48	
	Total	34	14	48	70.8
10-12 months	pelvis	9	8	17	
	phalanx II	11	2	13	
	Total	20	10	30	66.7
12-18 months	phalanx I	22	19	41	
	D.metacarpal	42	108	150	
	D.metatarsal	14	103	117	
	D.humerus	30	8	38	
	P.radius	37	14	51	
	Total	145	252	397	36.5
24-42 months	D.tibia	32	43	75	
	calcaneum	19	31	50	
	P.femur	3	24	27	
	Total	54	98	152	35.5
42 months	D.femur	5	7	12	
	P.humerus	1	5	6	
	D.radius	1	23	24	
	P.tibia	2	24	26	
	ulna	2	25	27	
	Total	11	84	95	11.6

C: 2nd-3rdC.AD

Age at Fusion	Element	F	UF	Total	%F
9-12 months	scapula	8	6	14	
	Total	8	6	14	57.1
10-12 months	pelvis	1	2	3	
	phalanx II	2	2	4	
	Total	3	4	7	42.9
12-18 months	phalanx I	9	5	14	
	D.metacarpal	3	7	10	
	D.metatarsal	3	10	13	
	D.humerus	11	1	12	
	P.radius	8	2	10	
	Total	34	25	59	57.6
24-42 months	D.tibia	5	9	14	
	calcaneum	0	9	9	
	P.femur	1	6	7	
	Total	6	24	30	20.0
42 months	D.femur	0	4	4	
	P.humerus	0	1	1	
	D.radius	0	6	6	
	P.tibia	2	4	6	
	ulna	0	5	5	
	Total	2	20	22	9.1

D: 3rd-4thC.AD

Age at Fusion	Element	F	UF	Total	%F
9-12 months	scapula	6	1	7	
	Total	6	1	7	85.7
10-12 months	pelvis	1	0	1	
	phalanx II	1	0	1	
	Total	2	0	2	100.0
12-18 months	phalanx I	4	1	5	
	D.metacarpal	4	16	20	
	D.metatarsal	0	13	13	
	D.humerus	4	4	8	
	P.radius	4	0	4	
	Total	16	34	50	32.0
24-42 months	D.tibia	6	14	20	
	calcaneum	1	11	12	
	P.femur	0	5	5	
	Total	7	30	37	18.9
42 months	D.femur	0	13	13	
	P.humerus	0	5	5	
	D.radius	0	5	5	
	P.tibia	1	8	9	
	ulna	1	8	9	
	Total	2	39	41	4.9

Table 18; a-d; Epiphyseal fusion data for cattle remains from Fishbourne by phase.

The ageing results for pigs from Fishbourne are clearly very different to both Copse Farm (Figure 55) and Chichester Cattlemarket (Figure 56). At Copse Farm there is clear selectivity of pigs at the age of maturity or just prior to it at stages D and E. This site has a much smaller sample size though the inference is in the consumption of pig. The presence of a single mandible at stage B may suggest small scale rearing at the site. The data from Chichester Cattlemarket shows a great range of age stages. There seems to be little selectivity, as at Fishbourne, though there is a preference towards stage D in the final phase. The irregularity in the age profile at Chichester is more suggestive of different households keeping pigs in the town; the presence of samples from very young pigs at Chichester indicates that some breeding may have taken place. Alternatively, a variety of pigs of different age, including 'suckling pigs' were being transported to the town and traded.

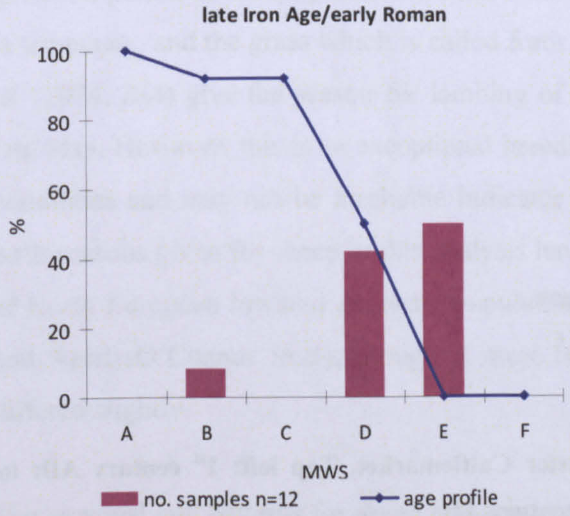


Figure 55; Dental ageing for pig specimens from Copse Farm (late Iron Age/early Roman).

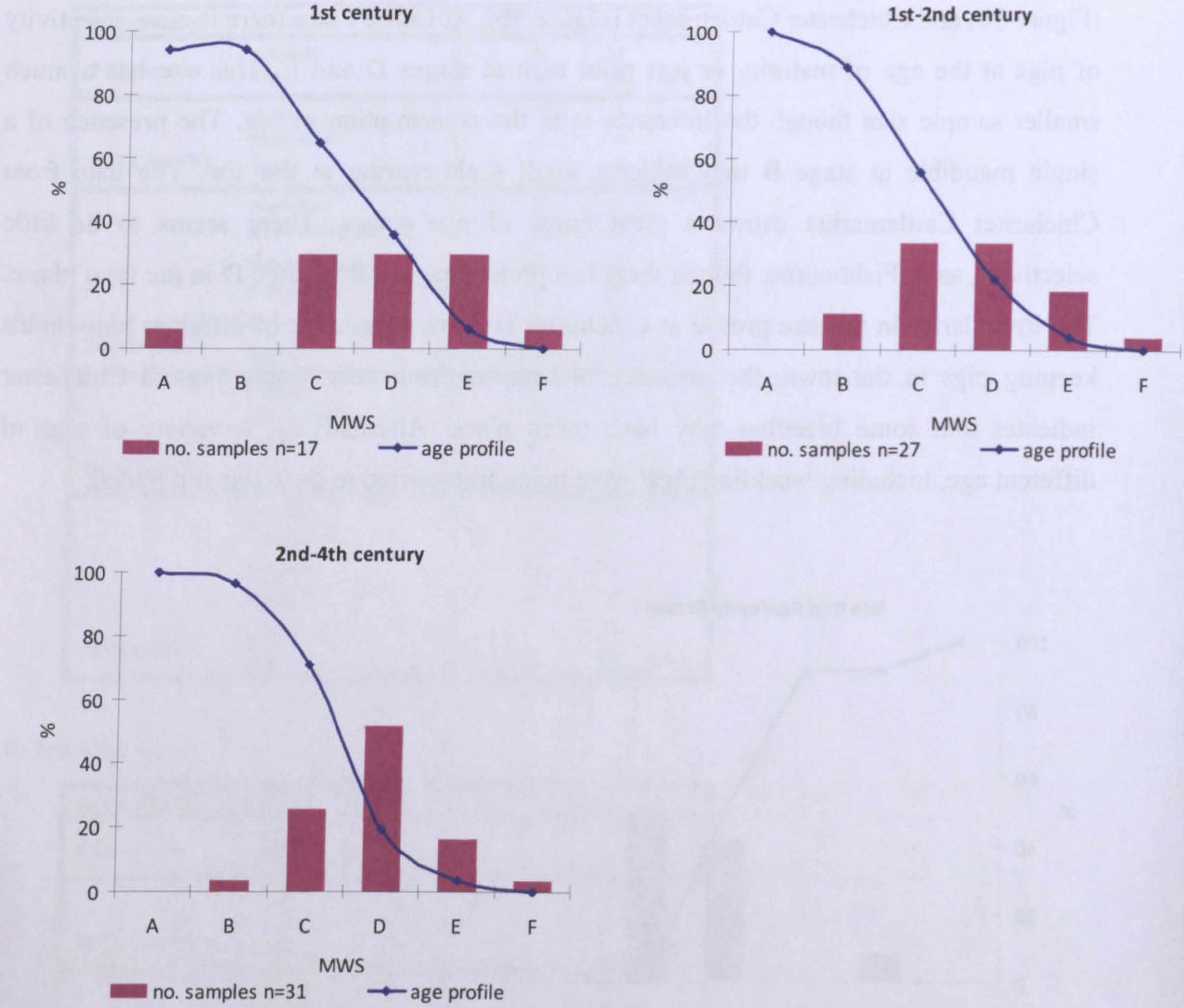


Figure 56; Dental ageing data from Chichester Cattlemarket. Top left: 1st century AD; top right: 1st-2nd century AD; bottom left: 2nd-4th century AD.

3.6.3 Seasonality

As set out in the methods section, the seasonality data have been generated by taking radiographic images of the mandibles of sheep and pigs. The data have been arranged into three categories dependant on the estimated age of the animal and the accuracy range of the estimated age. This range is given in number of months: for example, a mandible assigned an estimated age of between 1 and 2 months would have an accuracy range of 2 months; a mandible assigned an estimated age between 10 and 14 months has an accuracy range of 5 months. The main group of data include the most accurately aged samples where specimens have been estimated to be aged between 0 and 2 years, with an accuracy range within and inclusive of 1 and 4 months. These data are displayed in the graphs by a thickened unbroken line. A second set of data include samples which were also from animals aged between 0 and 2 years of age but include specimens given by any age range. This sample is graphically represented by a thin dotted line. A third set of data includes samples from animals between 0 and 3 years of age though returning to an accuracy range within and inclusive of 1 and 4 months. This sample is graphically represented by a thin dashed line. Clearly, specimens could fall into more than one of the datasets described here; the data are congregated in this way to show variation between the accuracy of age estimation and differing sample sizes. The estimated ages for each individual specimen are given in appendix D.IX.

3.6.3.1 Sheep and Goats

It is difficult to pinpoint exactly the lambing season for Iron Age/Romano-British sheep populations (*cf.* O'Connor 1998, 7). For practices in Roman Italy, Pliny (*Hist. Nat.* 8.71-72) gives the period of mating sheep very precisely as May 13th to July 23rd and, given the gestation period of sheep, places the lamb's time of birth at the end of autumn when "the air is temperate, and the grass which is called forth by the early rains is just growing." Jewell *et al.* (1974, 234) give the season for lambing of Soay sheep on Orkney between March and late May. However, this is an exceptional breeding group which reside in particular climatic conditions and may not be a reliable indicator for other sheep populations in Britain. The birth seasons given for sheep in this analysis have been based upon modern rearing practices of North European lowland domestic populations where ewes give birth to lambs in March and April (O'Connor *ibid.*), though it must be remembered that the actuality may have differed slightly.

The seasonal cull patterns for sheep and goats at Fishbourne are restricted to particular times of year in both 1stC.BC-AD and the 1st-2ndC.AD (Figure 57; Figure 58). Data from 1stC.BC-AD suggests that the majority of specimens aged 0-2 years were culled between July/August and November/December with relatively few specimens recorded from outside this range. Data from the 1st-2ndC.AD indicates a similar July/August to November/December pattern though in a lower frequency to those in the 1stC.BC-AD but with a much greater cull frequency around January time. A minority of samples were recorded to have been killed around April in both phases.

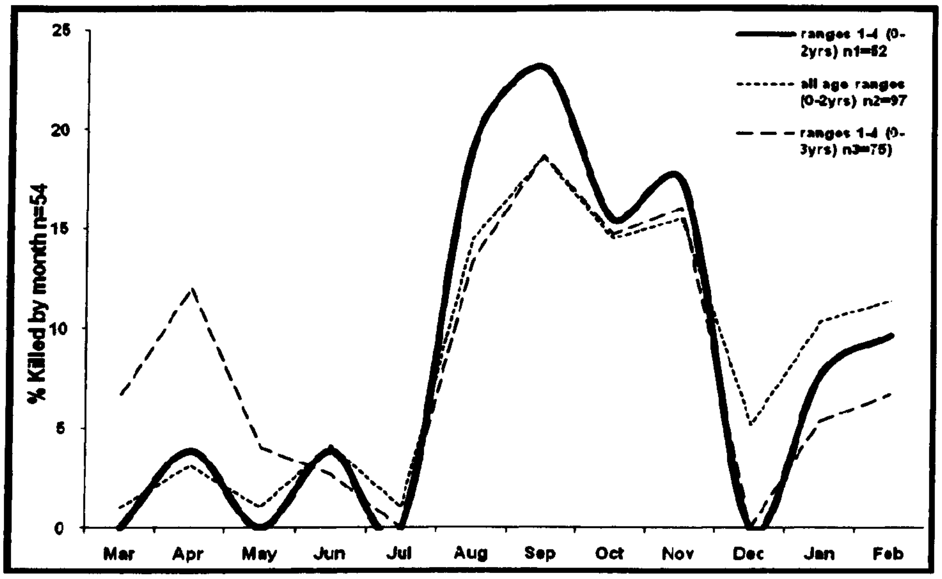


Figure 57; Relative frequency of sheep/goat mandible samples by recorded month of death from 1stC.BC-AD at Fishbourne.

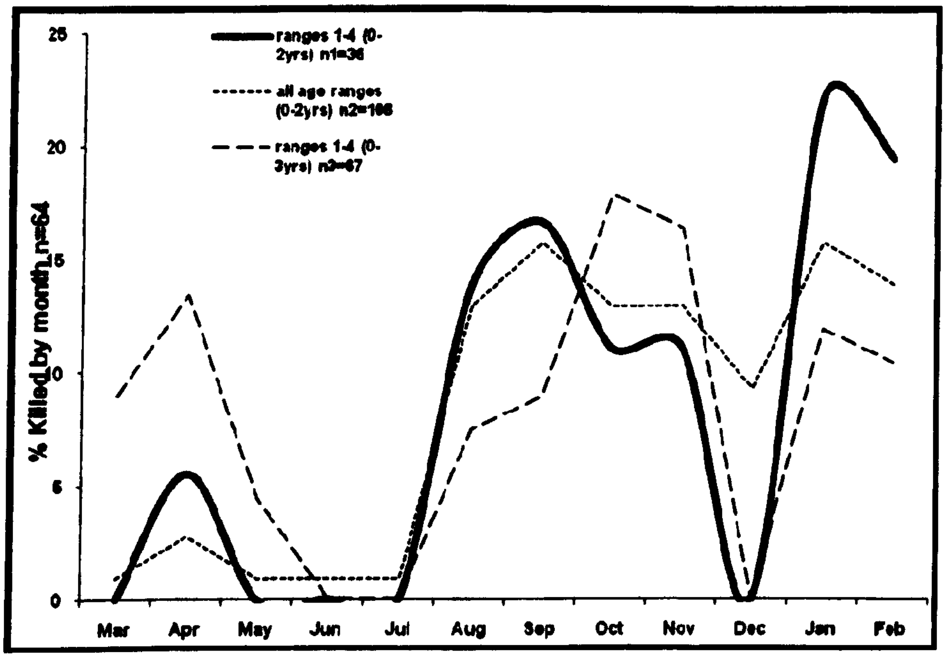


Figure 58; Relative frequency of sheep/goat mandible samples by recorded month of death from 1st-2ndC.AD at Fishbourne.

The data from Chichester Cattlemarket indicates similar patterns of sheep/goat cull were taking place over the first two phases (Figure 59; Figure 60). Samples from 1st-2nd century AD deposits were generally restricted to a July/August to November/December kill period though with a considerable frequency also occurring around January. Samples from 2nd-3rd century AD deposits show the same pattern of change as indicated contemporarily at Fishbourne with a remaining, but reduced, frequency of samples present between July and December, though at a much increased frequency in January. Samples from the 4th century

AD deposits also show a similar pattern to the previous ones. However, in this period, the data show an increased frequency of samples recorded for *c.*April time, at the expense of the high peak in January seen in the 2nd-3rd century AD samples.

When the main data (i.e. 0-2 years/1-4 month accuracy range) are compared with those from the 'less accurate' sample groups, the relative frequencies remain similar to the primary set of samples. Mild differences occur in both Fishbourne phases where samples which include the 2-3 year old specimens indicate a slightly higher frequency of cull during April. The same is also true for the Chichester Cattlemarket data for the 2nd-3rd century AD sample and, to a lesser extent, the 4th century AD sample.

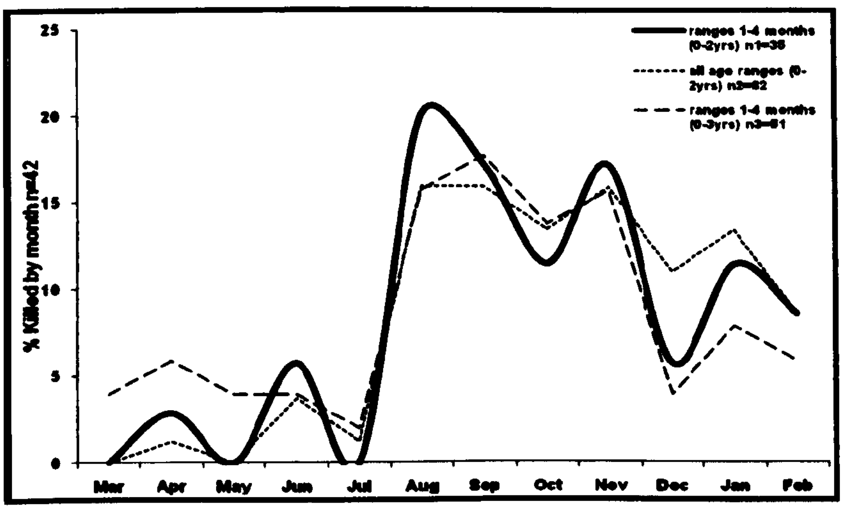


Figure 59; Relative frequency of sheep/goat mandible samples by recorded months of death from 1st-2nd century AD at Chichester Cattlemarket.

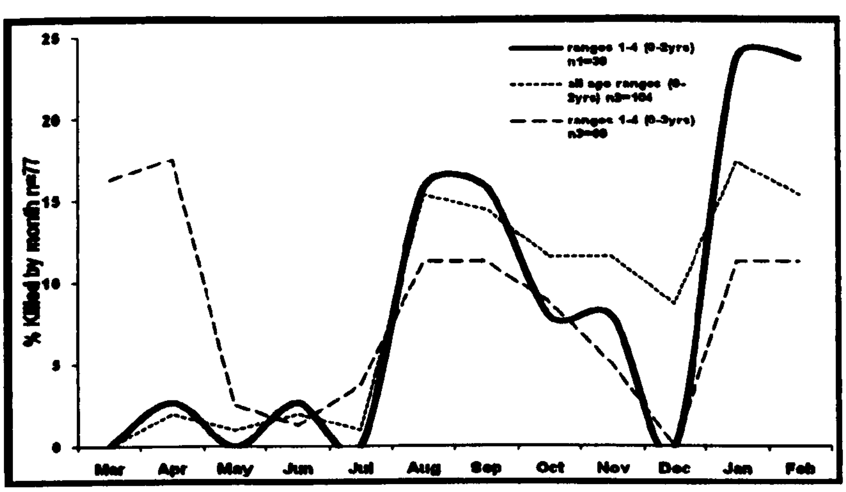


Figure 60; Relative frequency of sheep/goat mandible samples by recorded months of death from 2nd-3rd century AD at Chichester Cattlemarket.

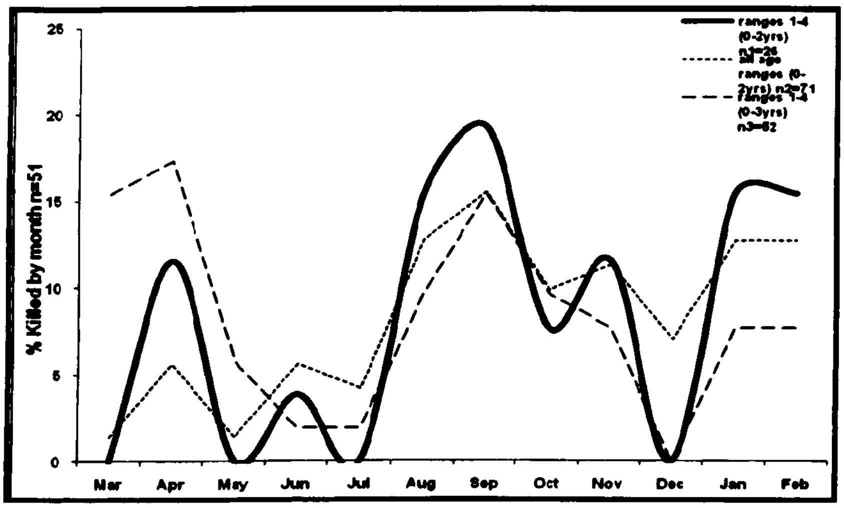


Figure 61; Relative frequency of sheep/goat mandible samples by recorded months of death from 4th century AD at Chichester Cattlemarket.

Sample sizes from other sites were not sufficient to generate relative frequencies on the scale given by the Fishbourne and Chichester Cattlemarket samples. Some did provide, however, indications of seasons of cull by examining the minimum range of season reflected by all, or at least the majority of samples which gave records of within and inclusive of 1 and 4 months of accuracy. An interpretive summary of these results are given in Table 19. Here it was possible to estimate seasonal patterns from sites across the Iron Age/Romano-British transition. The samples from Copse Farm (Oving phase 1 and phase 2) did not provide any cohesive seasonal pattern. At best the samples could be said to show that culling may have taken place at any point during the year. The samples from North Bersted, by contrast, gave a main culling season around late autumn/winter time, whereas the samples from Carne's Seat (although admittedly numbering only 2) suggest that these individuals were killed during the spring. This data somewhat concurs with the ageing data through dental wear (Chapter 3.6.1) which, I have argued, is suggestive that Carne's Seat was only occupied seasonally because of the presence of only very young and elderly individuals. Varro (*De Re Rus.* 2.2.12-14) suggests that rams which are to be used for breeding are removed from the flock 2 months prior to mating and are given more or better quality fodder (or placed in better pasturage). Varro (*ibid.*) states that ewes should not be mated before 2 years old and that 3 years olds are best. The main breeding group was likely to have been kept at sites such as Copse Farm which included young and early mature individuals. North Bersted, on the other hand, indicated much greater selectivity of animals probably for meat production. This could easily follow the late autumn/winter culling of animals for meat preservation.

Phase	Site	Type	Main culling season	No. samples
	North Bersted	enclosed farm	late autumn/winter	6
Late Iron Age	Oving phase 1	enclosed farm	all year	8
	Oving phase 2	enclosed farm	all year	8
	Carne's Seat	enclosure	spring	2
	Chichester Phase 1	urban	late summer/autumn	23
LIA/ERB	Fishbourne Phase 1	elite settlement	late summer/autumn	32
	Chichester Phase 2	urban	autumn/winter	35
	Fishbourne Phase 2	elite settlement	autumn/winter	32
	Fishbourne Harbour	villa	autumn	2
	Lavant	enclosed farm	autumn/winter	4
Early Roman	Elsted	enclosed farm	autumn-spring	5
	Chichester Phases 3 & 4	urban	all year	26
Late Roman	Batten Hanger	villa	autumn/winter	3

Table 19; Minimum 'kill' seasons of sheep and goat from all sites (only samples within four month range included).

As shown, the samples from Fishbourne and Chichester Cattlemarket differ from these smaller rural sites with a main cull season in late summer/autumn in the early phase with a shift towards autumn/winter culling in the early Roman phase (1st-2ndC.AD). The earlier phase 'late summer' cull, as O'Connor (1998, 10) points out, is not a practice in preparation for the hardships of winter but may be in fact based on agronomist advice such as Columella (*ibid.*) who states that suburban estates should dispose of young lambs to retain the milk of the ewe. This would optimise the milking of ewes in late summer so that cheese could be made and stored through the autumn and winter. Columella's advice is explicitly referring to estates which were sited close to a town and which could transport lambs quickly to market for sale (O'Connor *ibid.*). Such an interpretation would also follow the interpretation from the ageing data of the existence of a breeding flock at Fishbourne.

Other rural sites in the Roman period tend to follow the pattern from North Bersted with cull patterns generally around autumn/winter. Without the different cull seasons seen across sites in the late Iron Age it would seem that a greater level of sheep husbandry was taking place directly from the farm. Varro (*De Re Rus.* II, 2.14) also indicates that pregnant ewes should be kept on the same drinking water throughout pregnancy as any change would damage the lamb. This would suggest less movement of flocks. Results from samples of the later phases at Chichester spread more evenly throughout the year, indicative of a more extensive market economy with animal trading taking place over longer periods.

3.6.3.2 Pigs

Tighter birthing seasons for pigs is easier to estimate than for sheep as pre-modern populations can be closer paralleled with wild boars which, in temperate climates, will generally mate at the same time each year normally in April/May (Carter and Magnell 2007; Ervynck 2005, 151). There is the possibility of second farrowing or the second annual breeding of domestic populations in more intensive management systems (Ervynck and Dobney 2002). Roman authors discuss the purposeful biannual breeding of domestic pigs (Mackinnon 2001, 659) and, though the presence of second farrowing has rarely been proven to exist in archaeological populations (though see Ervynck and Dobney 2002, 20), this possibility must be considered.

Only specimens from Fishbourne and Chichester provided suitable samples for this analysis. These were analysed as single groups to enhance the sample sizes, though all the specimens have been dated to the 1st-3rd centuries AD. Analysis of seasonal ageing of pig mandibles provide, unlike the sheep samples, remarkably contrasting results between the two sites. The Fishbourne data shows two peaks: a large spike around May and a broader curve across November to September (Figure 62). Neither of these peaks is relatively high. The data from Chichester however, generate higher cull peaks over more restricted ranges (Figure 63). There is a relatively high frequency of specimens which were recorded to fit around November/December and two smaller peaks situating around May/June and another around September. The main 'winter' peak at Chichester is a greater frequency than at any point in the 'Fishbourne season'. Another difference between the two datasets is that the periods of peak cull at Chichester are more restricted than at Fishbourne. At Fishbourne, pigs seem to have been slaughtered all year round but with smaller increases and decreases throughout the year. Viewing the 'less accurate' data from Chichester, however, suggests that these patterns were much closer to that at Fishbourne and it may be that subtle variation in cull timings existed.

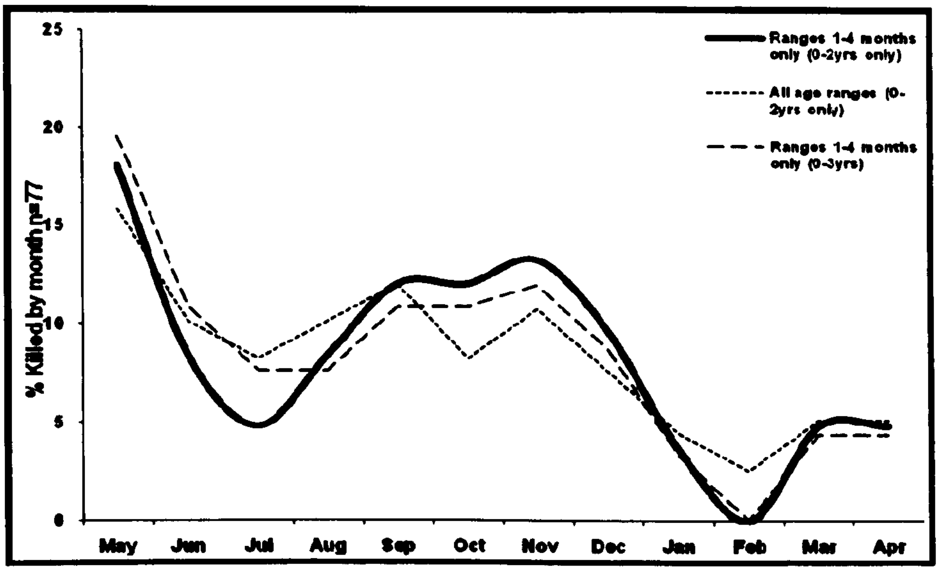


Figure 62; Relative frequency of pig mandibles by recorded month of death from phases 1 to 3 at Fishbourne (*c.*1stC.BC-3rdC.AD).

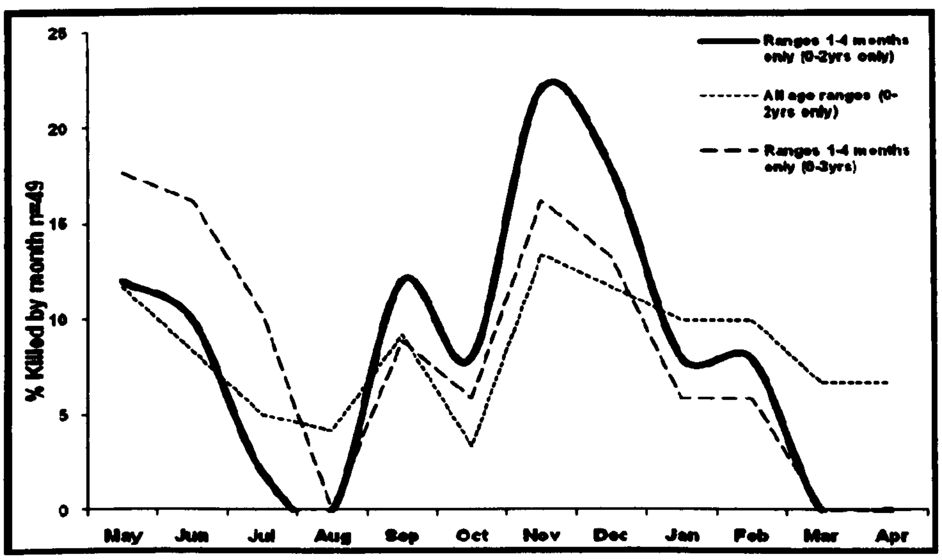


Figure 63; Relative frequency of pig mandibles by recorded month of death from 1st to 3rd centuries at Chichester Cattlemarket.

The double peaks indicated by both Fishbourne and Chichester samples might indicate the existence of second farrowing. The pig ageing data from Fishbourne (Chapter 3.6.2.3) suggest that a regular breeding regime was in operation. Columella's (*De Re Rus.* 7.9.4) system for suckling-pig production requires a strategy of biannual farrowing where the sow conceives twice a year, in the summer and winter, following a pattern of four months pregnant and two months suckling. This system was designed for large rural estates which were close to urban markets and could therefore maximise profits in this way. Varro (*De Re Rus.* 2.4.13) highlights the same regime though, in contrast to Columella, cautions against such regimes arguing that it produces 'poorer' piglets in the winter. A relatively high frequency of piglets was recovered from Fishbourne as well as sizable quantities of pigs aged less than 6 months at Chichester in each phase. A high frequency of piglets being consumed in May could be indicative of such a regime and certainly the vast proportion of the most accurately aged specimens were recorded as culled either around 6 months or 1 year (see appendix D.IX).

If Fishbourne was breeding and supplying pigs to Chichester then it this may explain the higher frequency of animals being consumed in the winter months. These would be the excess stock after those which had been not been consumed at Fishbourne during the summer/autumn months. It is interesting to note that the peak cull at Fishbourne takes place in late spring and at Chichester in late autumn. This would suggest patterns of supply, demand and movement between the two sites.

3.6.4 Sexing

Sexing data, based on non-metric traits, has been collected for sheep/goats and cattle based on the morphology of the pelvis, and on the morphology of the canines for pigs, as described in the methods.

3.6.4.1 Sheep and Goats

Sexing data were collected from six sheep/goat pelves at Fishbourne (Table 20). 3 dated to 1stC.BC-AD and 3 to 1st-2nd century AD. All three 1stC.BC-AD pelves were female, 2 of the 1st-2nd century AD pelves were female and 1 belonged to a male.

Sheep/Goat	Female	Male
1stC.BC-AD	3	-
1st-2ndC.AD	2	1
2nd-3rdC.AD	-	-
3rd-4thC.AD	-	-

Table 20; Number of sexed sheep/goat specimens by phase. All specimens are sexed based on the morphology of the pelvis.

3.6.4.2 Cattle

Sexable cattle specimens were present in all four phases at Fishbourne (Table 21). The samples in 1stC.BC-AD and 2nd-3rdC.AD deposits produced 3 specimens belonging to females and 1 belonging to a male, though this ratio is reversed in 1st-2ndC.AD deposits. Only 1 of each sex is represented by specimens in 3rd-4thC.AD.

Cattle	Female	Male
1stC.BC-AD	3	1
1st-2ndC.AD	1	3
2nd-3rdC.AD	3	1
3rd-4thC.AD	1	1

Table 21; Number of sexed cattle specimens by phase. All specimens are sexed based on the morphology of the pelvis.

3.6.4.3 Pigs

The pig ageing data was far more extensive than for sheep/goats and cattle with both sexes represented in each phase and relatively large sample sizes being present in the 1stC.BC-AD and 1st-2nd century AD phases (Table 22). The pig sexing data was entirely produced by canine specimens. The results show that males were best represented in each phase though never by more than a ratio of 7:3. The lower sample sizes in 2nd-3rd centuries/3rd-4th centuries continued to generate similar ratios to those in the earlier phases. It is clear that both male and females were of importance on site as neither was necessarily preferred in isolation.

Pig	Female	Male
1stC.BC-AD	8	18
1st-2ndC.AD	21	32
2nd-3rdC.AD	3	7
3rd-4thC.AD	3	4

Table 22; Sex data for pig remains from Fishbourne by phase. All specimens are canines (n = number of specimens).

3.6.5 Metrics

There is growing evidence that sizes of British livestock altered between the late Iron Age and Roman periods (Albarella *et al.* 2008; Albarella, 2007; Dobney, 2001; Grant, 1989), though there seems to have existed regional differences in the extent and even direction of these trends (Maltby 1981; Noddle 1984; Luff 1999; Hammon 2005). With these aspects in mind I have analysed the metric data from Fishbourne to examine any possible shifts in animal size/shape through time, then I have compared these with hinterland sites where suitable Iron Age data are available as this tends to be minimal by comparison to post-Conquest material.

3.6.5.1 Sheep and Goats

The data from greatest length and breadth of proximal measurements from sheep/goat metacarpals indicates a similar pattern, but also differences between sites (Figure 64; Figure

65). The mean length of metacarpals increases at Fishbourne between 1stC.BC-AD and 1st-2ndC.AD, with the range increasing to include longer specimens in the latter. The metacarpals lengths from late Iron Age Copse Farm are smaller than those from Fishbourne in either phase. Late Iron Age Copse Farm is approximately contemporary with Fishbourne 1stC.BC-AD though the increasing mean calculations here could also be seen as chronological. There is also a small increase in the means of the metacarpal greatest lengths from the first to second phases at Chichester Cattlemarket, mirroring the shift seen at Fishbourne. The measurements from Chichester, however, tend to indicate smaller animals compared to those at Fishbourne. Data from the breadth of proximal metacarpals also indicate that a small increase in size took place over time (Figure 65).

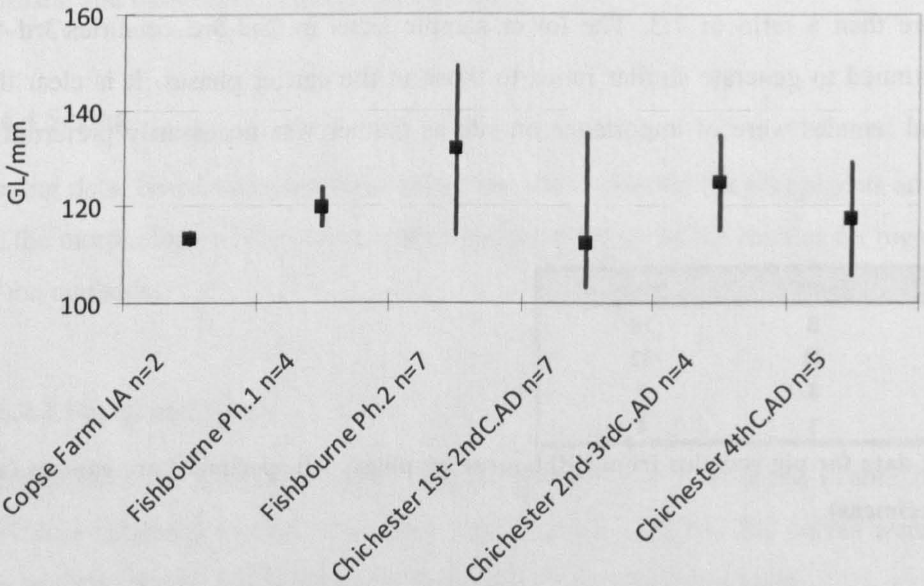


Figure 64; Range and means of greatest length measurements from sheep/goat metacarpals from Copse Farm (late Iron Age), Fishbourne and Chichester Cattlemarket.

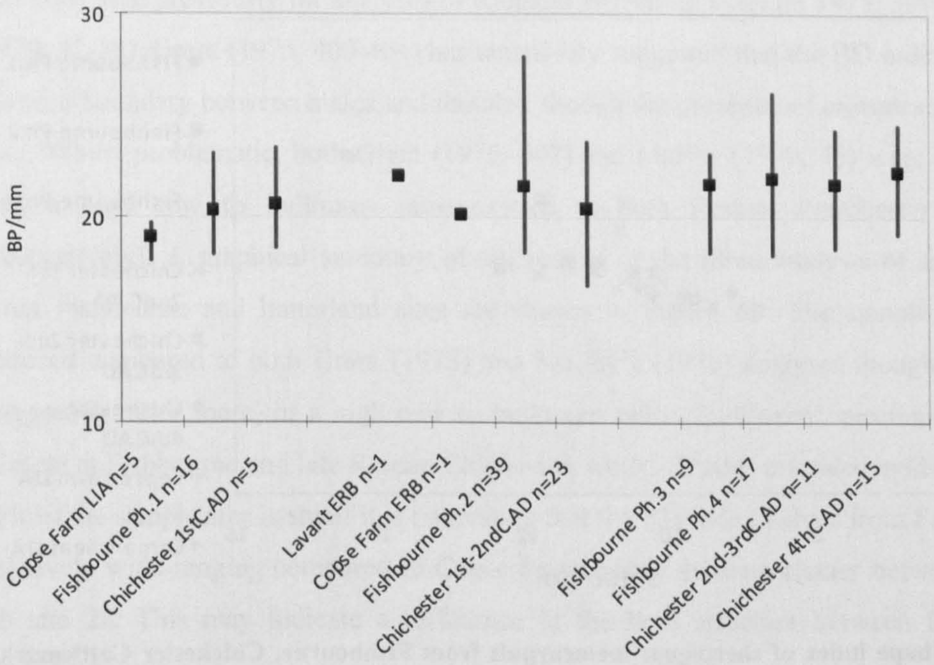


Figure 65; Breadth of proximal metacarpal from sheep/goat specimens from a number of hinterland sites.

Calculations of sheep/goat indices follow the trends of the size measurements. Data from Fishbourne 1stC.BC-AD and the first two phases from Chichester Cattlemarket each fall into tight distribution patterns of both metacarpal and metatarsal indices. Data from the late Iron Age sites at Copse Farm and Carne's Seat continually fall at the lower end of these ranges, whereas data from Fishbourne 1st-2ndC.AD and Chichester Cattlemarket 4th century AD specimens indicate greater ranges in shape index from the main group though increasing out suggesting the presence of a few larger stockier animals. The few specimens from Fishbourne 3rd-4thC.AD also fall within this upper range further indicating that this change is a temporal shift.

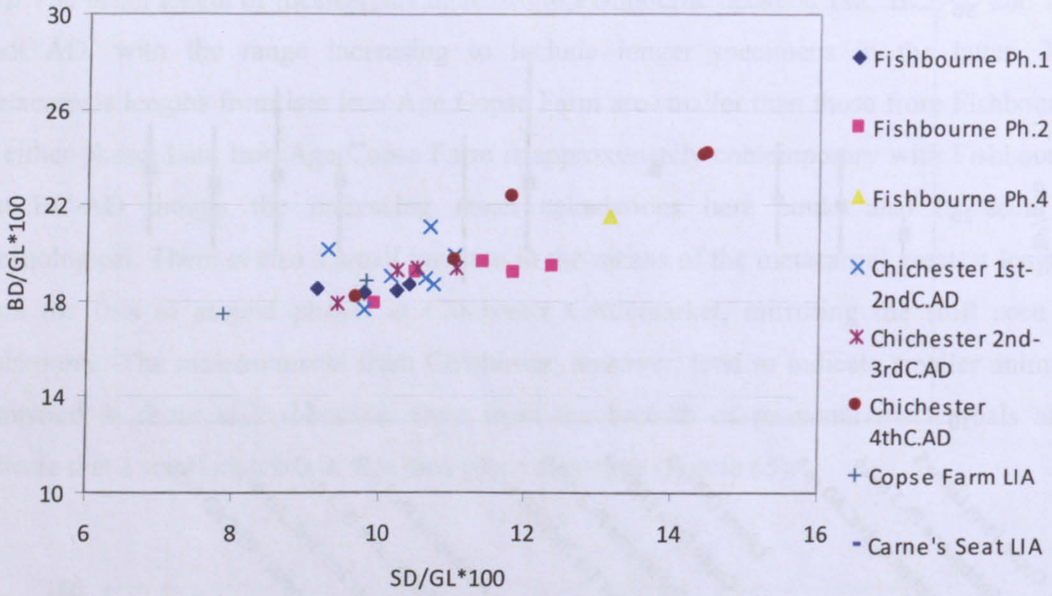


Figure 66; Shape index of sheep/goat metacarpals from Fishbourne, Chichester Cattlemarket, Copse Farm and Carne's Seat.

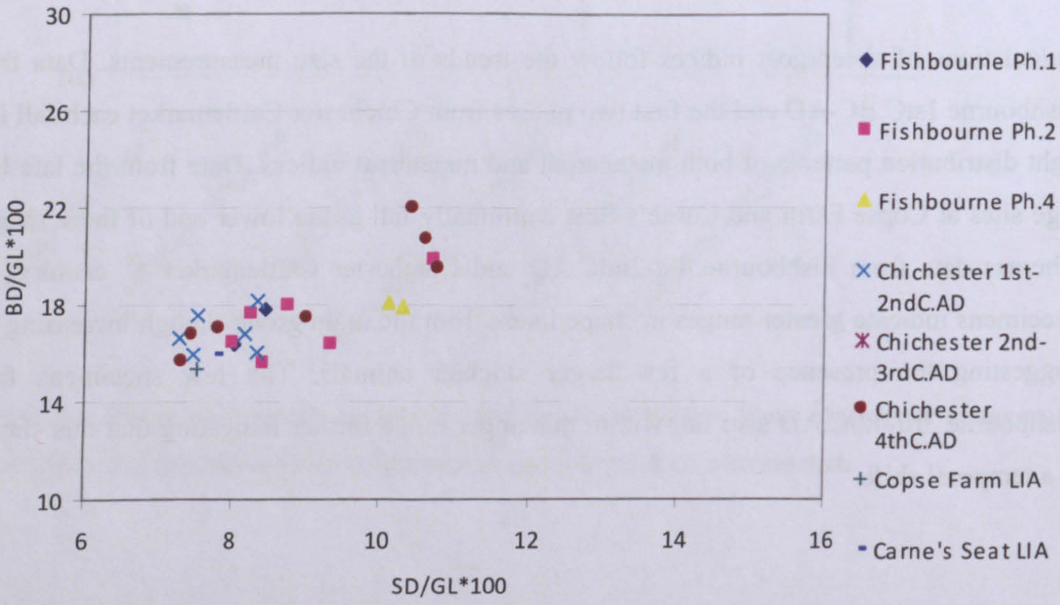


Figure 67; Shape index of sheep/goat metatarsals from Fishbourne, Chichester Cattlemarket, Copse Farm and Carne's Seat.

3.6.5.2 Cattle

Analysis of metrical data from cattle metacarpals are known to be a reasonably useful method for determining sex structure in archaeological assemblages. The BD index has been suggested to be an indicator of sexual dimorphism and can be achieved where the distal breadth is divided by the greatest length and multiplied by 100 (Howard 1963). This method has been used previously for analyses of Romano-British data (Grant 1975, 399-402; Maltby 1979; 32-35). Grant (1975, 400-401) has tentatively suggested that the BD index value of 30 forms a boundary between males and females, though the presence of castrates may blur this line. Whilst problematic, both Grant (1975, 402) and Maltby (1979, 33) were able to show that a high cow to bull/oxen ratio existed at both Roman Portchester and Exeter (respectively). A graphical summary of the results of the same analysis of samples taken from Fishbourne and hinterland sites are shown in Figure 68. The sample size is here reduced compared to both Grant (1975) and Maltby's (1979) analyses though the data are suggestive, once more, of a high cow to bull/oxen ratio. 'Bull/oxen' specimens were only present at Fishbourne and late Roman Chichester, whilst all sites provided evidence of cows. Whilst the sample size is small it is interesting that the BD index values from Fishbourne are relatively wide-ranging compared to Copse Farm where the data cluster between values of 26 and 28. This may indicate a difference in the herd structure between the two rural settlements.

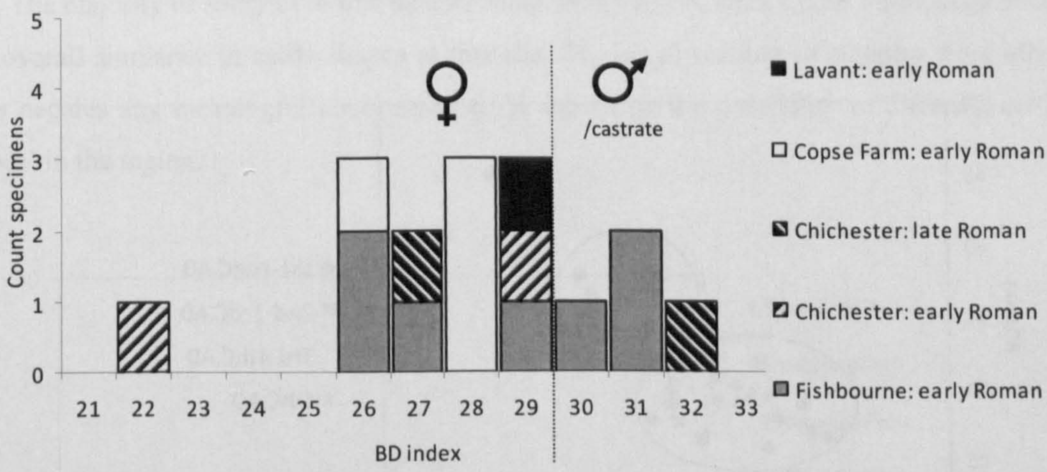


Figure 68; Count of cattle metacarpal specimens based upon the 'BD index' (or breadth of distal end / greatest length x 100).

The possible presence of castrates is clearly problematic when distinguishing between sex and, therefore, for understanding the wider economic character of the herd. This fact is further compounded by the BD index boundary being estimated by Grant (1975, 401) rather than being based on modern data. Finer resolution in size difference and clustering seems to be apparent in plots of the distal breadth against the smallest diameter of the shaft (BDxSD) (Figure 69; Figure 70). Three distinct data groups can be observed in this analysis: a highly populated 'small' group which range between 24-31mm SD and 46-53mm BD, a lesser populated 'large' group which range between 30-33mm SD and 53-59 BD, and thirdly, a number of outliers which extend from the 'large' group by either an increased SD measurement or an increased SD/BD measurement.

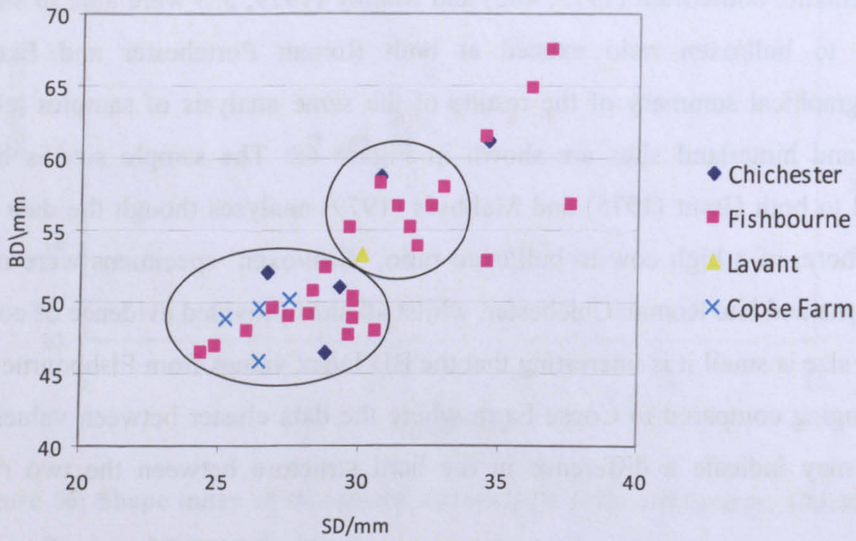


Figure 69; Scatterplot of cattle metacarpal dimensions (SDxBD) by site.

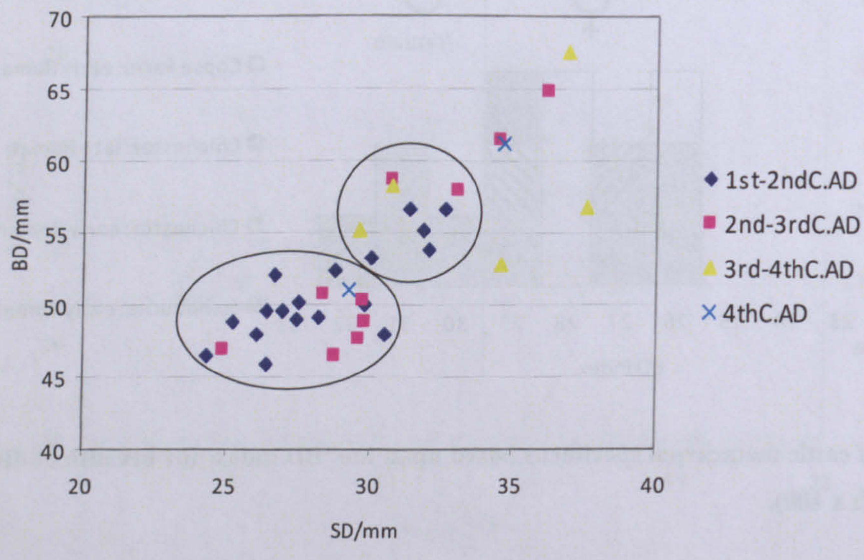


Figure 70; Scatterplot of cattle metacarpal dimensions (SDxBD) by date.

Specimens from Fishbourne clearly provide the greatest number of data and with the widest range. This plot also confirms the contrasting tight clustering of the Copse Farm specimens. When these data points are observed by chronological variation a further pattern becomes clear (Figure 70). Specimens dating to the 1st-2ndC.AD exhibit a relatively short range with specimens only present in the first two groups and plotting in close proximity. This may be significant considering that specimens from this phase constitute the largest sample size. By the 2nd-3rdC.AD six specimens still plot in the 'small' group, though the distance increases between these and those in the large group, plus there is the appearance of the outliers in this phase. The sample size reduces after this phase though, by the 3rd-4thC.AD, a greater number of specimens are represented in the 'large' group and by outliers. It is by this phase that outlying specimens exist along two separate dimensions. It is here that the presence of oxen may be most apparent with the longer, slimmer castrate bones plotting differently to thicker, broad bulls. Specimens with the extended BD measurements may also indicate splayed condyles at the distal epiphysis of the metacarpal. This phenomenon has recorded on metapodia from a number of other archaeological sites in Britain and interpreted as evidence of traction with the excess stress of heavy loading generating morphological changes to the medial condyle (Maltby 1979, 32; Albarella and Davis 1994; Dobney *et al.* 1996, 39).

The biometric data are suggesting that, over time, male cattle become more frequent and that castrates may have been more of a feature in the herds at Fishbourne. Shape indices calculated from cattle metatarsals indicate that the data are quite tightly distributed (Figure 71). The majority of samples in this dataset come from early Roman Copse Farm, suggesting the overall similarity in cattle shapes at this site. The small number of samples from other sites negates any meaningful conclusions to be drawn on the possibility of differing cattle 'types' in the region.

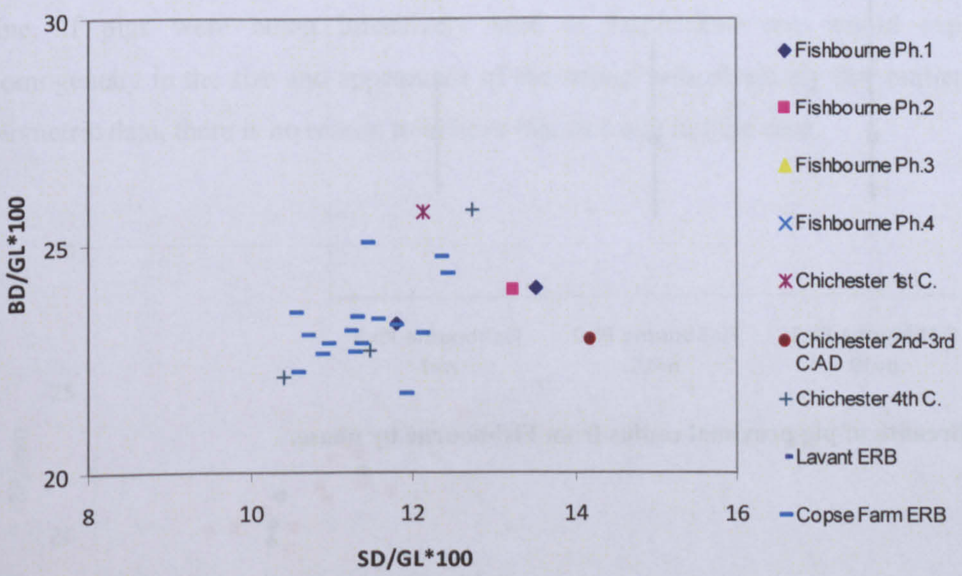


Figure 71; Shape index of cattle metatarsals from hinterland sites.

Overall, the cattle biometric data suggest that an increasing frequency of male cattle took place over time, though the development of different 'breeds' of cattle did not necessarily take place. This certainly fits with the cattle ageing data from Fishbourne which indicates a shift from a wide range of age groups represented and a focus on younger animals which indicate the presence of a breeding herd primarily exploited for meat and dairy. However, the shift towards greater frequencies of older animals in the later period also coincides with the move towards breeding bulls and oxen for use in traction and arable agriculture.

3.6.5.3 Pigs

Pig sizes remained relatively similar throughout the period of occupation at Fishbourne. According to the breadth of proximal radius measurements, the mean size of the pigs stayed almost identical from 1stC.BC-AD to the 2nd-3rd century AD (Figure 72). This is also true for the lower limit of the size range for this measurement from each phase. The upper limit, however, does decrease over time indicating a greater restriction in pig sizes with a lower frequency of slightly larger animals. The sample size also decreases from 1stC.BC-AD to the 2nd-3rd century AD though one would expect both limits of the size range to retract if this was affecting the data. Measurement of the breadth of the acetabulum also indicates that little size change took place over time at Fishbourne. The increase in mean calculation seen in later phases is defunct by small sample sizes.

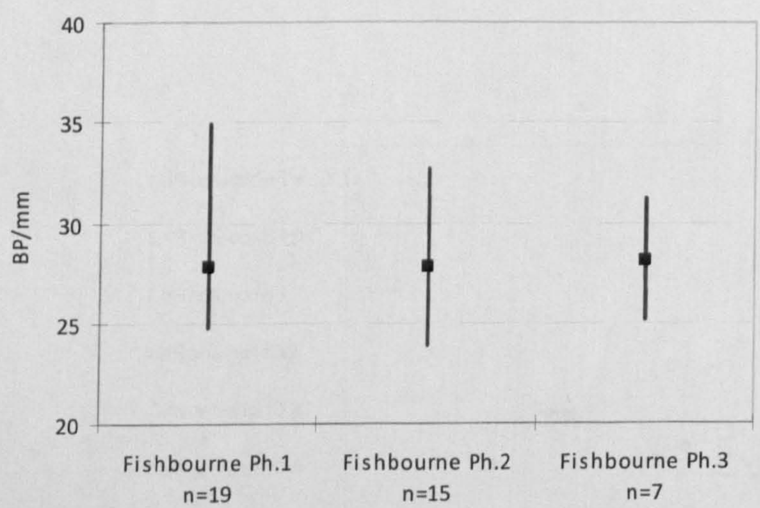


Figure 72; Breadth of pig proximal radius from Fishbourne by phase.

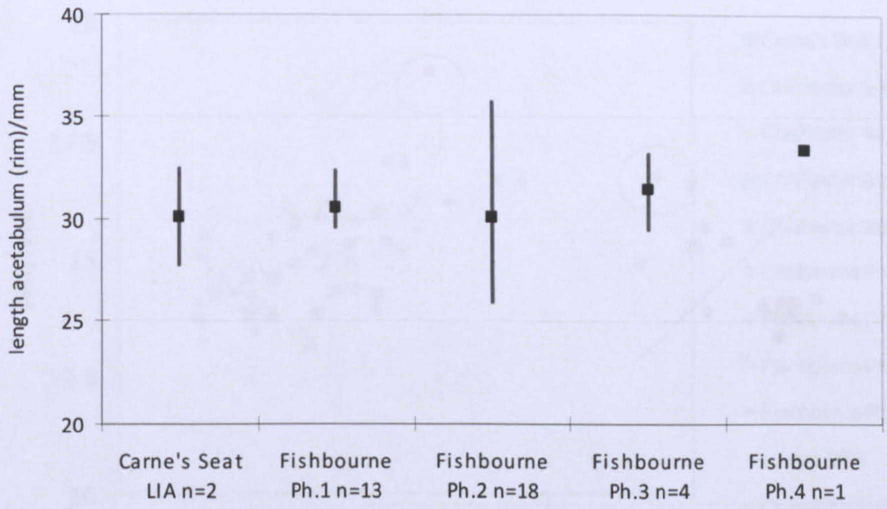


Figure 73; Length of acetabulum (rim to rim) from pig specimens at Fishbourne by phase. Includes data from late Iron Age Carne's Seat for comparison.

A general restriction in the range of pig sizes is also indicated by the comparison of metacarpal proximal breadths against greatest lengths (Figure 74; Figure 75). The results from both 3rd and 4th metacarpal measurements tend to cluster together from each phase, and there is no way of differentiating between each phase based on the data. There are, however, two sets of clustering in both datasets, a 'smaller' and a 'larger' group, which have no separation based on phasing but are possibly representative of sexually dimorphism. I have marked the boundary between the clusters on both Figure 74 and Figure 75 with a dashed line. If pigs were being intensively bred at Fishbourne one would expect greater homogeneity in the size and appearance of the animal with relatively few outliers. From the biometric data, there is no reason to believe that this was not the case.

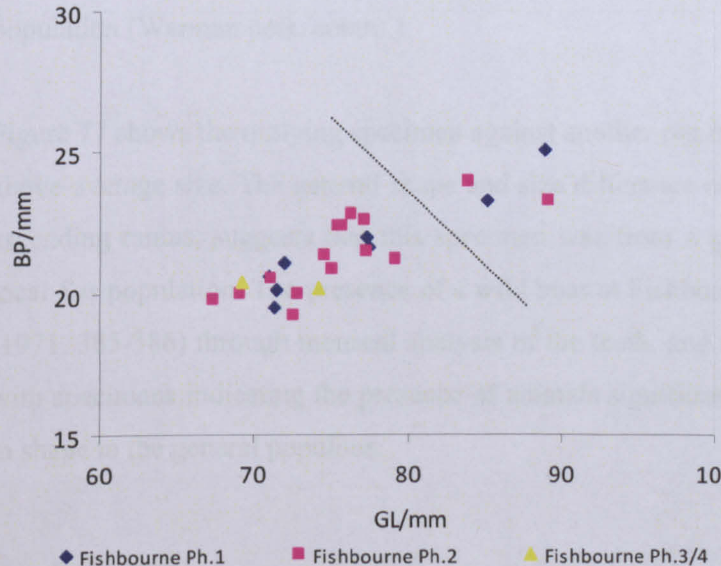


Figure 74; Proximal breadths versus greatest lengths of pig 3rd metacarpals.

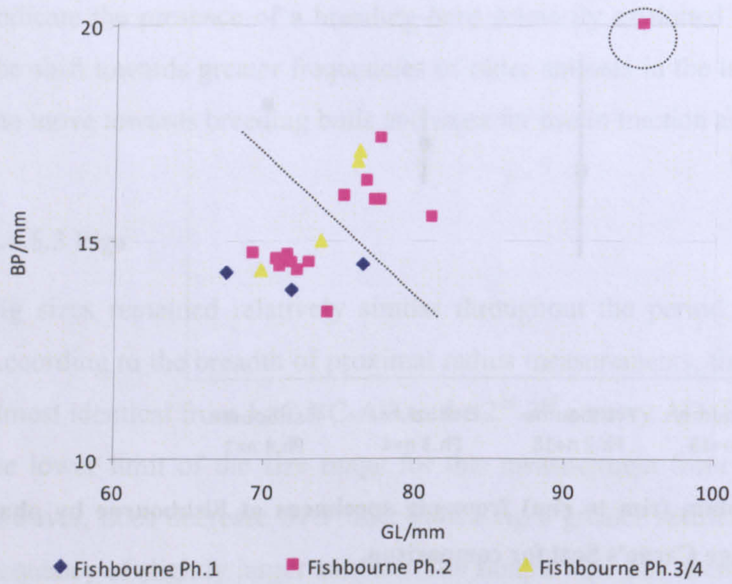


Figure 75; Proximal breadths versus greatest lengths of pig 4th metacarpals.

When comparing the biometric data of pigs from Fishbourne to other hinterland sites, the evidence suggests that there are no body size changes over time or between different sites. Figure 76 shows the greatest length against the width of the anterior cusp of the 3rd molar in pigs from Fishbourne (all phases), Chichester Cattlemarket (all phases), Carne's Seat (late Iron Age), Lavant (early Roman), and Copse Farm (late Iron Age and early Roman). Length and width of the third molars in pigs are minimally affected by differences in age and sex (Albarella 2005, 596). This is arguably demonstrated by the 3rd molar measurements given here as the majority cluster together and show little separation in the data.

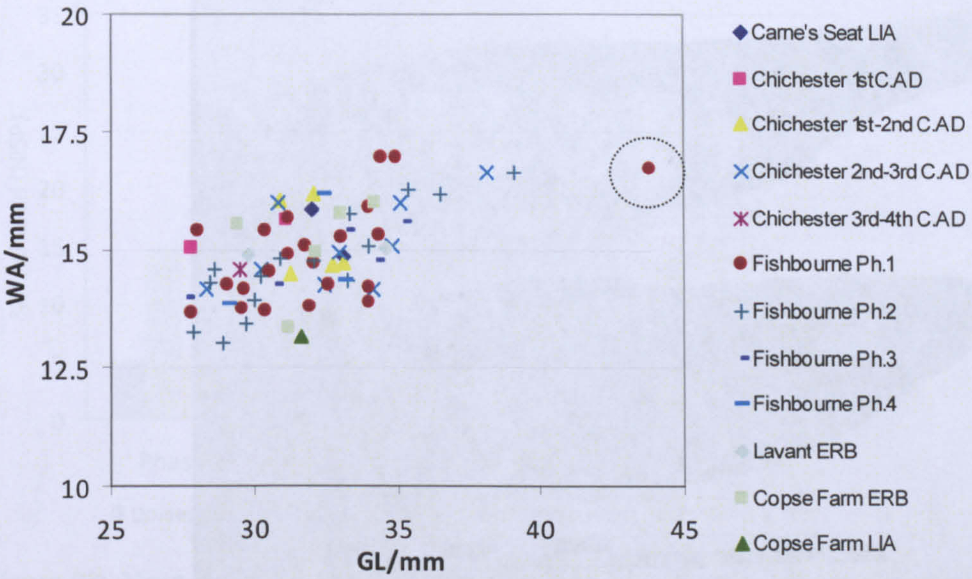


Figure 76; Metrical data from Sus scrofa third molars from Fishbourne hinterland sites by phase. The outlier (circled – specimen 1541) indicates a tooth of differing dimension possibly indicating an animal from outside the local breeding population.

Both the 4th metacarpal and 3rd molar measurements indicate the presence of an outlier to the main groups of data. Both these specimens are circled in the respective figures. The 4th metacarpal specimen is from 1st-2ndC.AD at Fishbourne and is over 15mm longer and 5mm wider at the proximal end than its closest counterparts. This difference is far in excess of the overall range of the main group. The outlying 3rd molar specimen is significant, not simply because it is much longer than other specimens in the main group, but because the width of the anterior cusp is not necessarily larger than those from the other samples. These two measurements, taken together, suggest that the specimen is morphologically different to the other pigs from the sample and is likely to have derived from a pig from a separate breeding population (Warman pers. comm.).

Figure 77 shows the outlying specimen against another pig mandible from the assemblage of above-average size. The general shape and size difference of the mandible, as it leads to the ascending ramus, suggests that this specimen was from a quite different type of pig to the local *Sus* population. The presence of a wild boar at Fishbourne was first proposed by Grant (1971, 385-386) through metrical analysis of the teeth, and my own data supports this view with specimens indicating the presence of animals significantly larger and possibly different in shape to the general populous.

Figure 77; Two *Sus scrofa* mandibles from Fishbourne. The upper mandible is from an adult pig from Chichester Cattlemarket, above average for its size. The lower mandible is from an animal outside the normal range of the local breeding population - specimen 1541 (*c.*AD43-75). Note the difference in the width of the ramus between the specimens.

3.6.6 Carcass Processing and Body Part Patterns

The data from cut marks and skeletal element representations are considered together here since they are generated from the same activity. Overall, evidence of cut marks (taken here to mean the full range of butchery/dismemberment techniques) on remains of the main domesticates are most frequent in 1st-2ndC.AD with similar lower frequencies in 1stC.BC-AD, 2nd-3rdC.AD and 3rd-4thC.AD deposits, although slight fluctuations exist (Figure 78). The increase in frequency of cut marks on remains from 1stC.BC-AD to 1st-2ndC.AD generally doubles in each of the main taxa groups given here ('domesticates' includes cattle, sheep/goat, pig, cow-sized and sheep-sized remains). Cattle remains continuously generate higher quantities of remains with evidence of cut marks compared with other taxa groups.

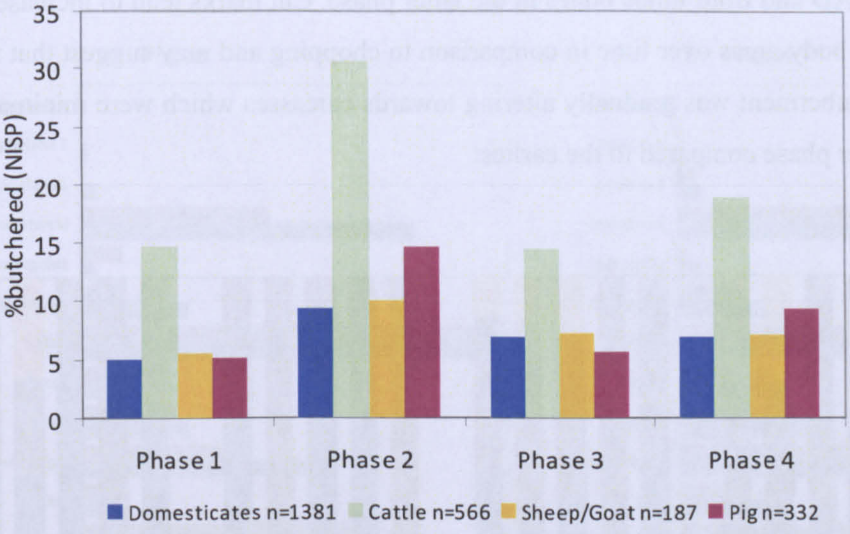


Figure 78; Mean quantities of specimens showing signs of cut marks as a percentage of the overall quantity of specimens for each taxa. 'Domesticates' includes specimens from cattle, sheep/goat, pig, cow-sized, and sheep-sized.

3.6.6.1 Sheep and Goats

In each phase sheep/goat remains tend to exhibit mostly chop and cut marks with the former occurring most frequently in 1stC.BC-AD and 1st-2ndC.AD, and cut marks becoming more frequent in the later two phases. Saw marks are only present in 1stC.BC-AD, 1st-2ndC.AD and 3rd-4thC.AD.

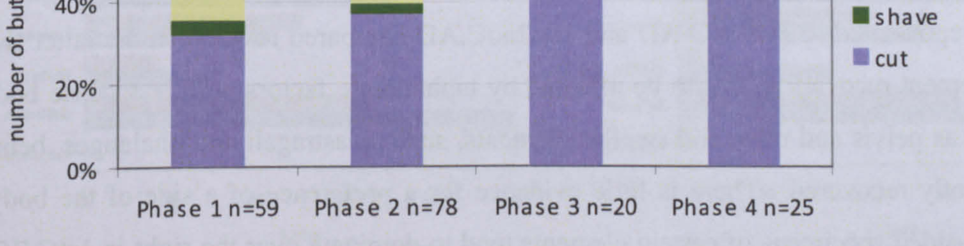


Figure 79; Relative frequency of mark-type on sheep/goat bones by phase.

In terms of body parts, all areas of the carcass tend to be subjected to chopping and dismemberment as well as cutting and filleting (Figure 80). The deliberate fracturing of remains is solely focused on rear limb bones, with some fracturing of foot bones in 1stC.BC-

AD and 1st-2ndC.AD and front limbs bones in the latter phase. Cut marks tend to increase in frequency in most body areas over time in comparison to chopping and may suggest that the methods of dismemberment was gradually altering towards carcasses which were minimally chopped in the later phase compared to the earliest.

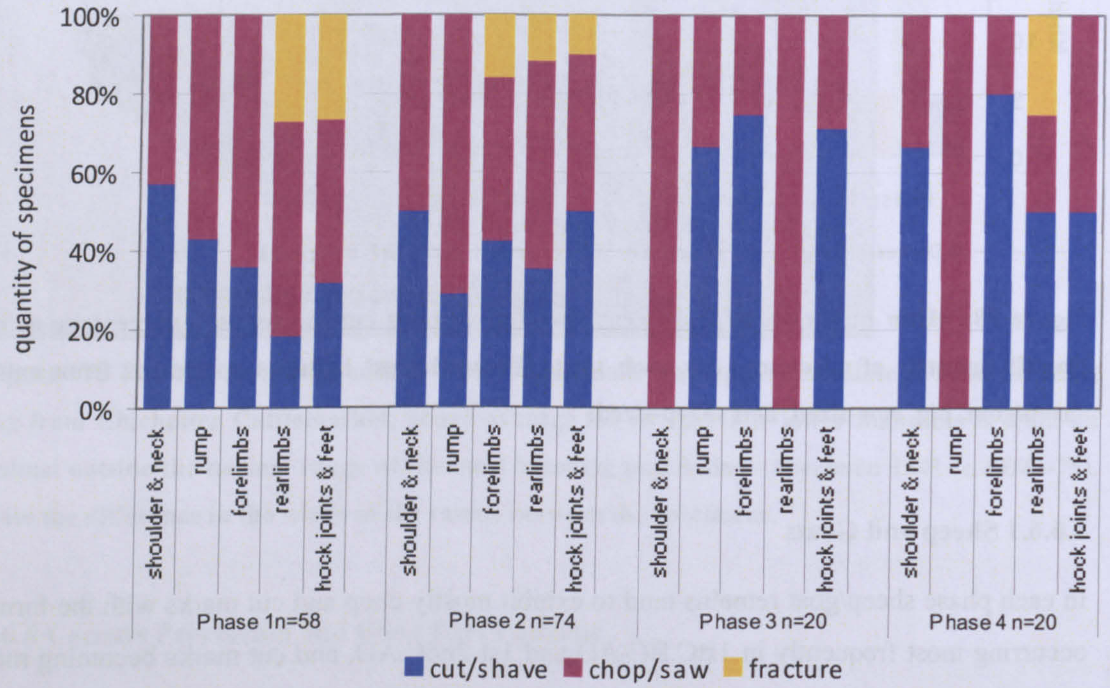


Figure 80; Relative frequency of mark-type by body part of sheep/goat by phase.

The body part patterns for sheep/goat remains tend to be dominated by metapodials, with tibial elements being well represented in the first two phases. The overall pattern of element recovery displays a similar pattern throughout each phase. Higher relative frequencies of most elements are displayed in 1stC.BC-AD/1st-2ndC.AD compared to 2nd-3rdC.AD/3rd-4thC.AD against the most commonly occurring element. This is most likely due to the greater sample size of the first two phases. In particular, elements from the front of the body are better represented in 1stC.BC-AD and 1st-2ndC.AD compared to those in the latter two phases. Element recovery seems to be affected by taphonomic factors with less dense body parts, such as pelvis and ulna, and smaller elements, such as astragali and phalanges, being less frequently recovered. There is little evidence for a preference of a side of the body, though left-sided specimens of certain elements tend to dominate over the right in 1stC.BC-AD, 2nd-3rdC.AD and 3rd-4thC.AD deposits. However, these are not enough to suggest purposeful selectivity. In 1stC.BC-AD/1st-2ndC.AD deposits the higher incidence of chopping and fracturing on rear limbs and foot seems likely to have contributed to this pattern.

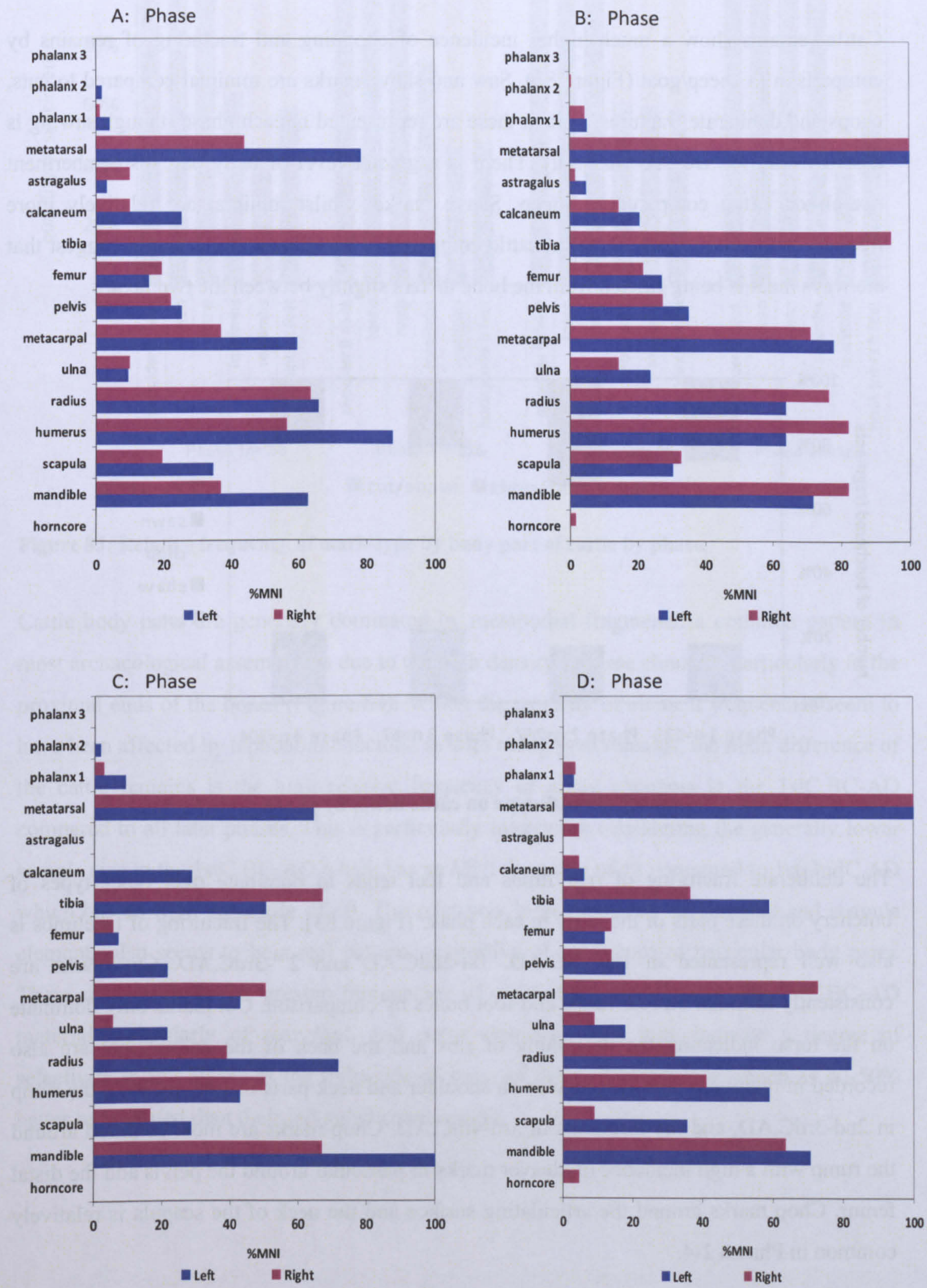


Figure 81; Body part patterns for sheep/goat remains from Fishbourne. MNI: Phase A = 41; B = 63; C = 18; D = 22.

3.6.6.2 Cattle

Cattle remains show a much higher incidence of chopping and fracturing of remains by comparison to sheep/goat (Figure 82). Saw and shave marks are minimal compared to cuts, chops and deliberate fractures, though these are represented in each phase (though sawing is absent from 1stC.BC-AD material). There is a greater level of body part dismemberment overall on cattle compared to sheep. Shave marks, whilst minimal are relatively more frequent compared to cuts alone on cattle compared to sheep/goat which might suggest that the ways meat is being filleted from the bone differs slightly between the two taxa.

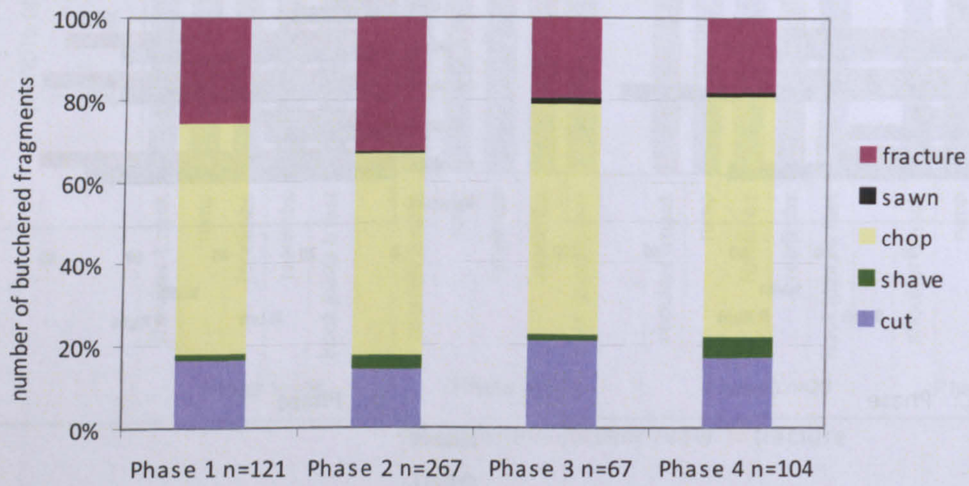


Figure 82; Relative frequency of mark-type on cattle bones by phase.

The deliberate fracturing of rear limbs and feet tends to dominate over other types of butchery on these parts of the body in each phase (Figure 83). The fracturing of forelimbs is also well represented in 1stC.BC-AD, 1st-2ndC.AD and 2nd-3rdC.AD. Cut marks are consistently minimal on rear limbs and foot bones by comparison. Cut marks only dominate on the torso indicating the defleshing of ribs and the back of the animal, but are also recorded in relatively high frequencies on shoulder and neck parts in 1stC.BC-AD, the rump in 2nd-3rdC.AD, and the forelimbs in 3rd-4thC.AD. Chop marks are most common around the rump with a high incidence of cleaver marks in particular around the pelvis and the distal femur. Chop marks around the articulating surface and the neck of the scapula is relatively common in Phases 2-4.

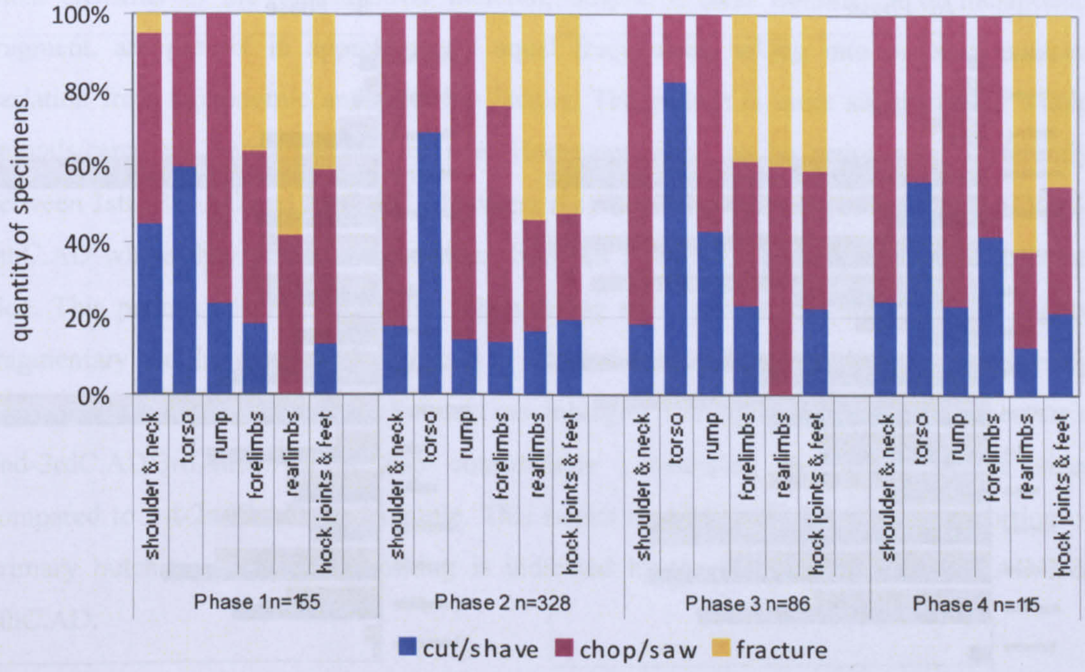


Figure 83; Relative frequency of mark-type by body part of cattle by phase.

Cattle body parts are generally dominated by metapodial fragments: a common pattern in most archaeological assemblages due to the high density of these elements particularly in the proximal ends of the bones (Figure 84). Whilst the majority of element frequencies seem to have been affected by taphonomic factors, as with sheep/goat remains, the main difference of the cattle remains is the high relative frequency of many elements in the 1stC.BC-AD compared to all later phases. This is particularly interesting considering the generally lower sample size in the 1stC.BC-AD which has an MNI for cattle of 18 compared to 1st-2ndC.AD which has an MNI for cattle of 49. The relatively high frequency of humerus and scapula elements also seems to be a real pattern, suggestive of preference of particular body parts. There also tends to be greater frequencies of right-sided elements in the 1stC.BC-AD material particularly of rear limb and rump elements. This may indicate a degree of selectivity in this Phase as the right-side of some of these elements is as much as 40-50% better represented than their left sided counterparts.

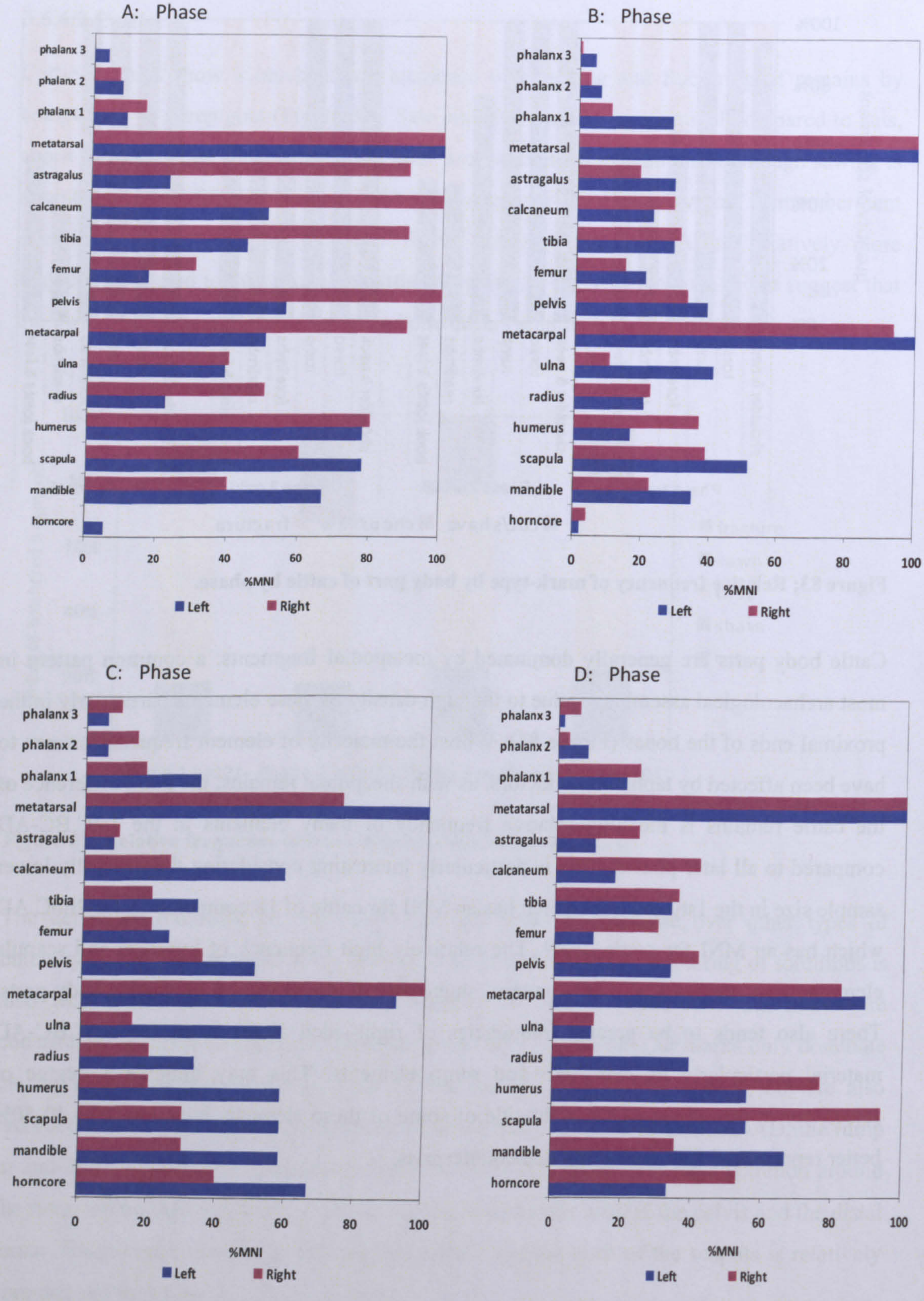


Figure 84; Body part patterns for cattle remains from Fishbourne. MNI: Phase A = 18; B = 49; C = 20; D = 18.

Most elements in the 1st-2ndC.AD material, despite a clear dominance of metapodial fragment, are present in approximately equal frequencies, taking into account nuanced variation from taphonomic and recovery factors. The pattern is more suggestive of whole animals/carcasses being present on site. Horncores seem to be represented differently between 1stC.BC-AD and 1st-2ndC.AD where they a relatively absent, to 2nd-3rdC.AD/3rd-4thC.AD where they generate frequencies between 55-65%, according to best represented side. This pattern is quite substantial when taking into account that horncores are highly fragmentary and therefore can be difficult to side and zone which generally causes their body part representation to be very low in most assemblages. The high occurrence of horncores in 2nd-3rdC.AD/3rd-4thC.AD is also considerable considering the lower sample sizes compared to 1st-2ndC.AD for example. This seems to suggest that a greater proportion of primary butchery waste/craft working is indicated by the material in 2nd-3rdC.AD/3rd-4thC.AD.

Overall, the ways that cattle carcasses were processed does not seem to have altered considerably over time, apart from a possible change to the way that the front limbs were removed from the body in 1stC.BC-AD compared to thereafter. This may also have affected the body part patterns in this phase to some extent. Patterns from 1stC.BC-AD are more suggestive of meat-bearing body parts being represented, and whilst this is a feature throughout the phases the tendency for increased levels of raw material production is further evident in later phases.

3.6.6.3 Pigs

Cut mark frequencies on pig remains differ to both sheep/goat and to cattle. There tends to be a higher frequency of cut marks on pig remains compared to cattle and a greater level of deliberate fracturing/sawing compared to sheep/goat (Figure 85). There is also a slight shift from a relatively higher frequency of chop remains in 1stC.BC-AD/1st-2ndC.AD towards cut marks in 2nd-3rdC.AD/3rd-4thC.AD. This may, however, be a product of much reduced sample sizes in the latter, which is also indicated by an absence of shave marks. The shift towards greater frequencies of cut marks in the later phase is mostly focused on shoulder and neck and, to a lesser extent, on forelimb body parts (Figure 86). However, there is a general decrease in cut marks on rear limbs and rump parts through time. These differences do not seem to indicate, however, any substantial difference in the methods of processing pig carcasses over time. It is possible that, in 1stC.BC-AD and 1st-2ndC.AD, all parts of the body were dismembered with cleaver implements and then further filleted with knives; whereas in 3rd-4thC.AD the front and rear body parts were treated separately, the front being affected by a low level of cleaver working compared to a relatively high level on the rear end parts of the animal.

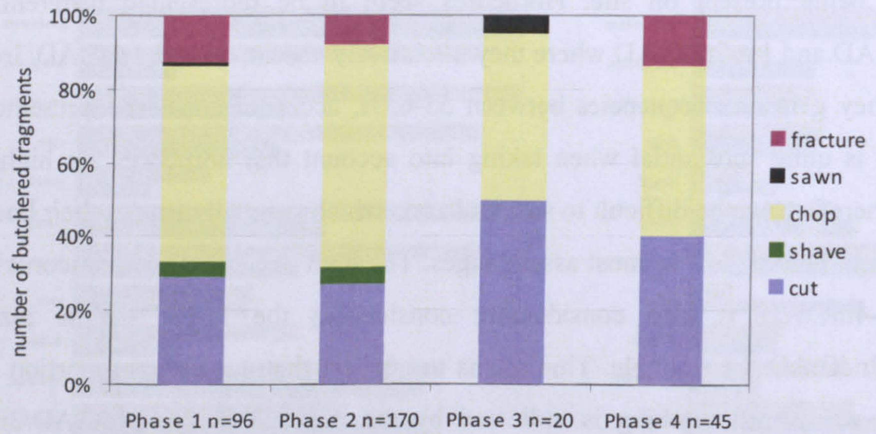


Figure 85; Relative frequency of mark-type on pig bones by phase.

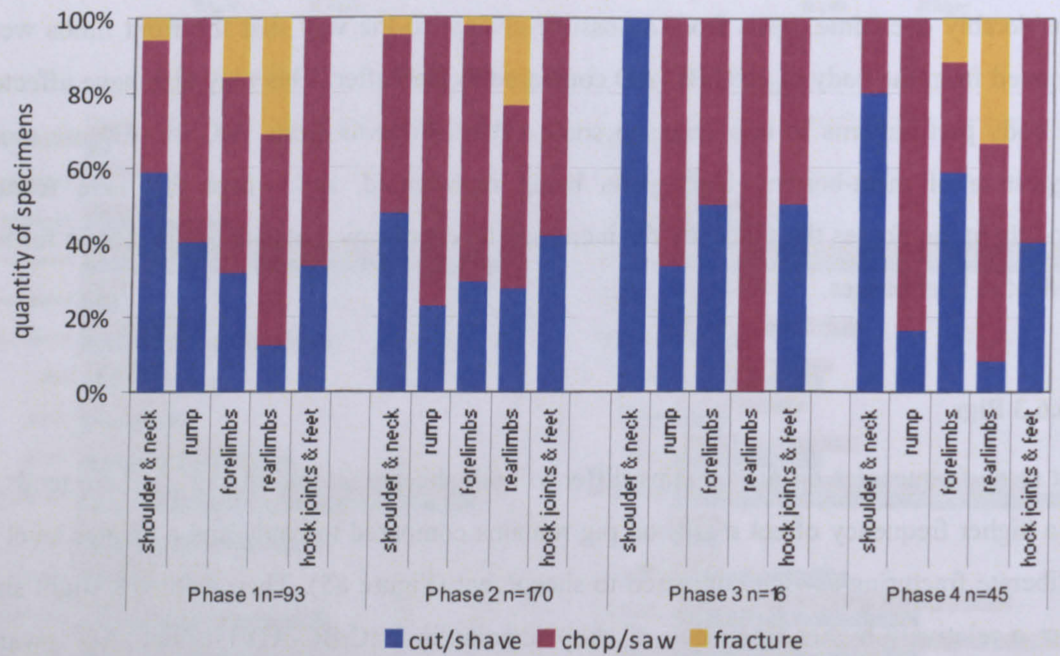


Figure 86; Relative frequency of mark-type by body part of pig by phase.

The body part patterns for pigs follow common patterns associated with this species from many archaeological assemblages with high frequencies of mandibles in particular and similarly high proportions of distal tibia fragments due to the increased density of this element in pigs (Figure 87). There are little differences in body part patterns between phases, though an apparent increase in frequency of forelimb parts in 1st-2ndC.AD by comparison. Rump and rear limb body parts are also well represented in 1st-2ndC.AD and 3rd-4thC.AD compared to 2nd-3rdC.AD in particular.

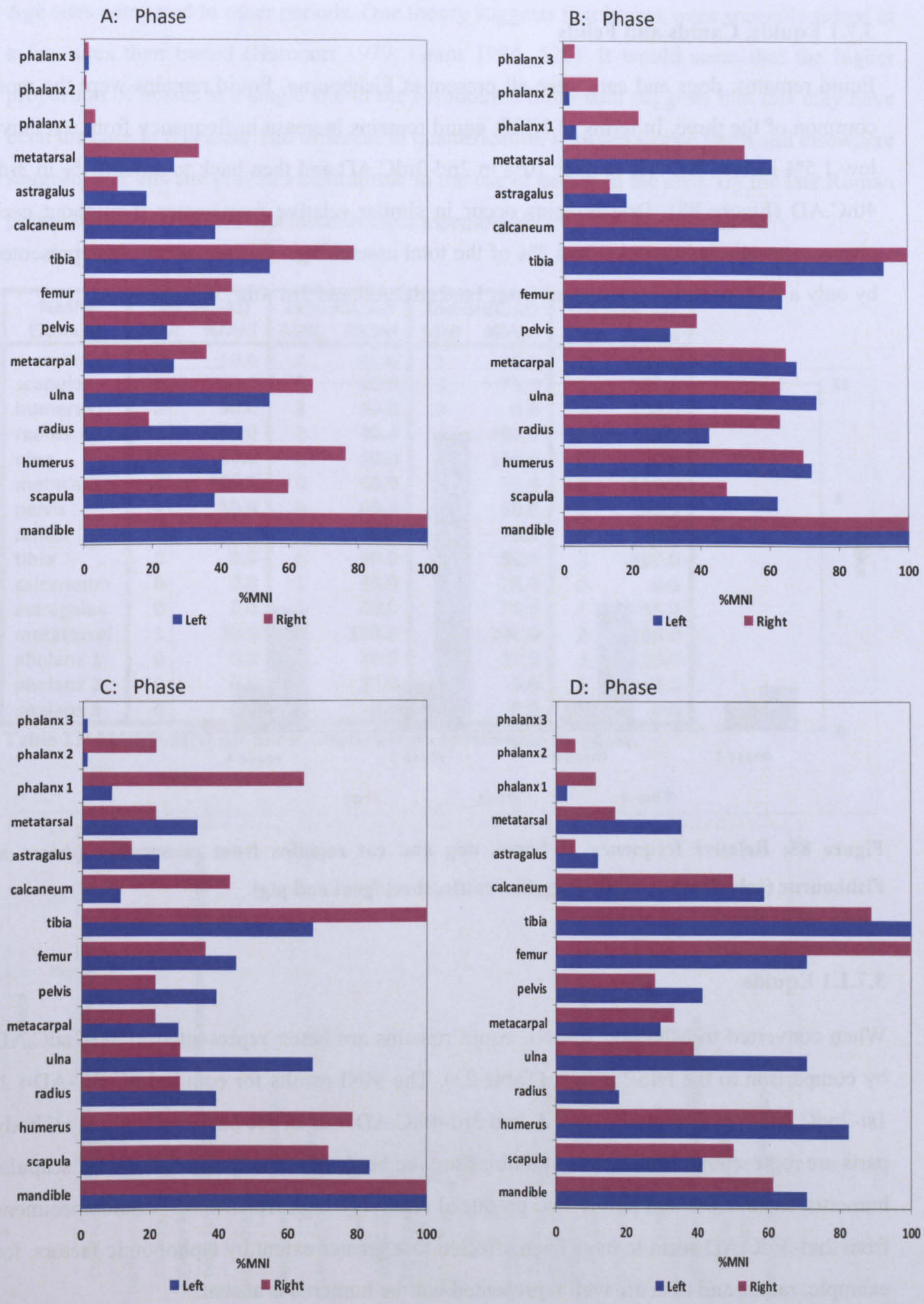


Figure 87; Body part patterns for pig remains from Fishbourne. MNI: A = 50; B = 71; C = 18; D = 18.

3.7 Other Animals from Fishbourne

3.7.1 Equids, Canids and Felids

Equid remains, dogs and cats were all present at Fishbourne. Equid remains were the most common of the three. In terms of NISP, equid remains increase in frequency from a relative low 1.5% in 1stC.BC-AD to over 10% in 2nd-3rdC.AD and then back to around 4% in 3rd-4thC.AD (Figure 88). Dog remains occur in similar relative frequencies throughout each phase, generally between 1% and 2% of the total assemblage. Cat remains were represented by only a few specimens recovered from 1st-2ndC.AD and 3rd-4thC.AD deposits.

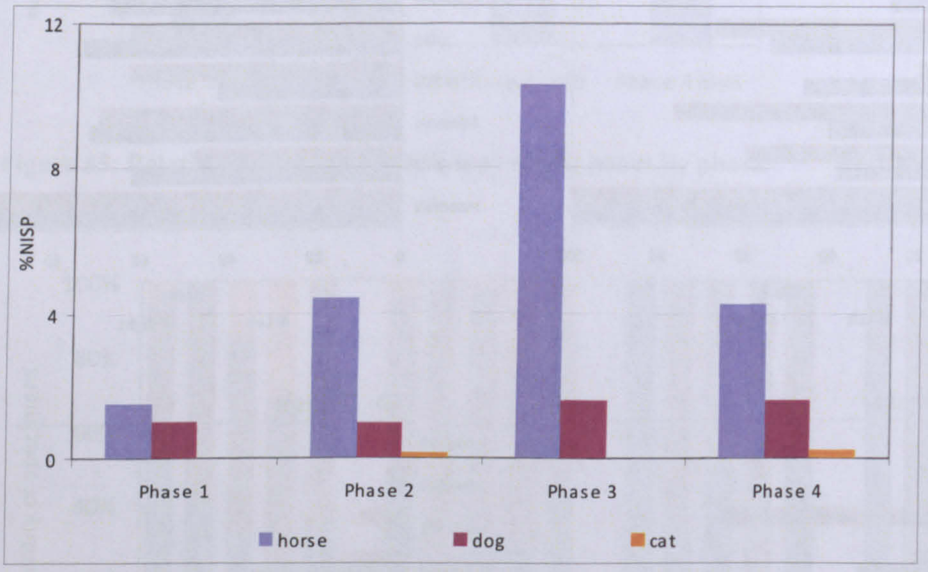


Figure 88; Relative frequency of horse, dog and cat remains from consecutive phases at Fishbourne (calculated as %NISP against cattle, sheep/goat and pig).

3.7.1.1 Equids

When converted to MNI and %MNI, equid remains are better represented in 1st-2ndC.AD by comparison to the NISP results (Table 23). The MNI results for equids 1stC.BC-AD= 2; 1st-2ndC.AD = 5; 2nd-3rdC.AD = 4, and 3rd-4thC.AD = 2. In 1st-2ndC.AD almost all body parts are represented. Metatarsals and tibiae are the best represented elements whilst scapula, humerus, metacarpal and pelvis also produced relatively high frequencies. Equid specimens from 2nd-3rdC.AD seem to have been affected to a greater extent by taphonomic factors, for example, radius and ulna are well represented but the humerus is absent.

The lower NISP frequencies in 1stC.BC-AD and 1st-2ndC.AD at Fishbourne are similar to the patterns from most other sites in the hinterland, except for Copse Farm, which provides the anomaly of relatively high frequencies from both late Iron Age and early Roman phases

(Figure 89). Bendrey (2010) has argued that equids are relatively well represented on Iron Age sites compared to other periods. One theory suggests that horses were specially raised at a few sites then traded (Harcourt 1979; Grant 1984, 522). It would seem that the higher proportion of horses at a single site in the Fishbourne hinterland suggests that this may have been the case in this area. The different in quantification between Copse Farm and elsewhere suggests that this site played a central role in the use of horses in the area. By the late Roman period horse percentages increased in most assemblages from those previous.

%MNI Element	1stC.BC-AD MNI	1stC.BC-AD %MNI	1st-2ndC.AD MNI	1st-2ndC.AD %MNI	2nd-3rdC.AD MNI	2nd-3rdC.AD %MNI	3rd-4thC.AD MNI	3rd-4thC.AD %MNI
mandible	1	50.0	2	40.0	1	25.0	2	100.0
scapula	0	0.0	3	60.0	3	75.0	1	50.0
humerus	1	50.0	3	60.0	0	0.0	2	100.0
radius	1	50.0	2	40.0	4	100.0	0	0.0
ulna	1	50.0	1	20.0	4	100.0	0	0.0
metacarpal	2	100.0	3	60.0	2	50.0	2	100.0
pelvis	1	50.0	3	60.0	2	50.0	1	50.0
femur	0	0.0	2	40.0	3	75.0	0	0.0
tibia	0	0.0	4	80.0	2	50.0	2	100.0
calcaneum	0	0.0	1	20.0	1	25.0	0	0.0
astragalus	0	0.0	1	20.0	3	75.0	1	50.0
metatarsal	1	50.0	5	100.0	4	100.0	2	100.0
phalanx 1	0	0.0	3	30.0	3	37.5	2	25.0
phalanx 2	0	0.0	1	10.0	0	0.0	1	12.5
phalanx 3	0	0.0	0	0.0	0	0.0	0	0.0

Table 23; MNI/%MNI for horse remains from Fishbourne by phase.

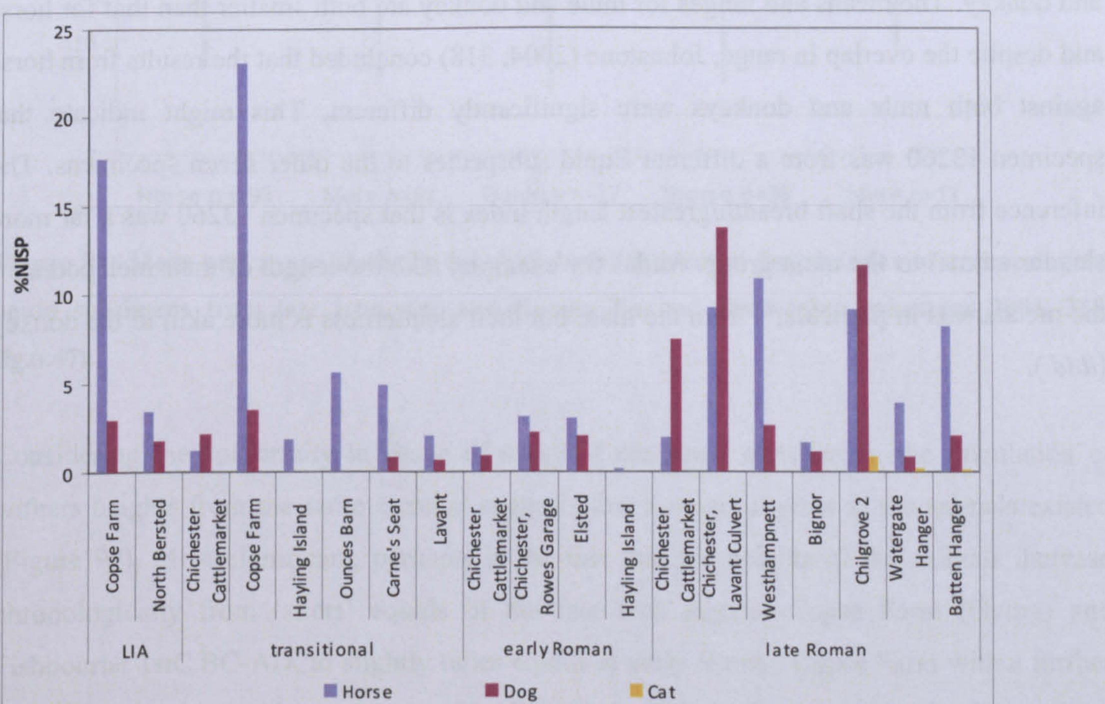


Figure 89; Relative frequency of equid, dog and cat from sites in the Fishbourne hinterland (calculated as % against cattle, sheep/goat and pig).

The separation of equid remains into species/subspecies is fraught with difficulties and there are currently only minimal published references which deal with the identification of horses *Equus caballus*, donkeys *Equus asinus* and mules *Equus asinus x Equus caballus* (Eisenmann 1986; Lepetz 2002; Peters 1988). Johnstone's (2004) examination of archaeological remains from late Iron Age and Roman Europe has provided a corpus of statistics against which to analyse biometric data. The separation of equid species can be achieved with a varying degree of accuracy from a number of different biometric analytical methods (Johnstone 2004, 146-150). Unfortunately it is not always possible to generate the data needed from some assemblages to satisfy many of these methods.

Analysis of shaft breadth/greatest length shape indices of equid metatarsals from Fishbourne and Chichester Cattlemarket indicate that most specimens were very similar in shape (Figure 90). One specimen (13260) from a 4th century deposit at Chichester Cattlemarket was found to be considerably different in shape to each of the other specimens. Comparing these data to Johnstone's summary statistics for this metric calculation indicates that the seven similarly shaped specimens each fall close to or slightly above the mean for horses, within the greatest limit of the range for mule, and at or above the greatest limit of the range for donkey (Figure 91). The restricted range of the similarly shaped specimens from Fishbourne and Chichester Cattlemarket, and considering their fit towards the mean figure, suggests that these are all from horse. The result from specimen 13260, however, sits below the range for horse, mule and donkey. The means and ranges for mule and donkey are both smaller than that for horse and despite the overlap in range, Johnstone (2004, 318) concluded that the results from horse against both mule and donkeys were significantly different. This might indicate that specimen 13260 was from a different Equid subspecies to the other seven specimens. The inference from the shaft breadth/greatest length index is that specimen 13260 was a far more slender animal to the main group. Mules for example, take the length of their metapodials - the metatarsals in particular - from the mare but their slenderness is more akin to the donkey (*ibid.*).

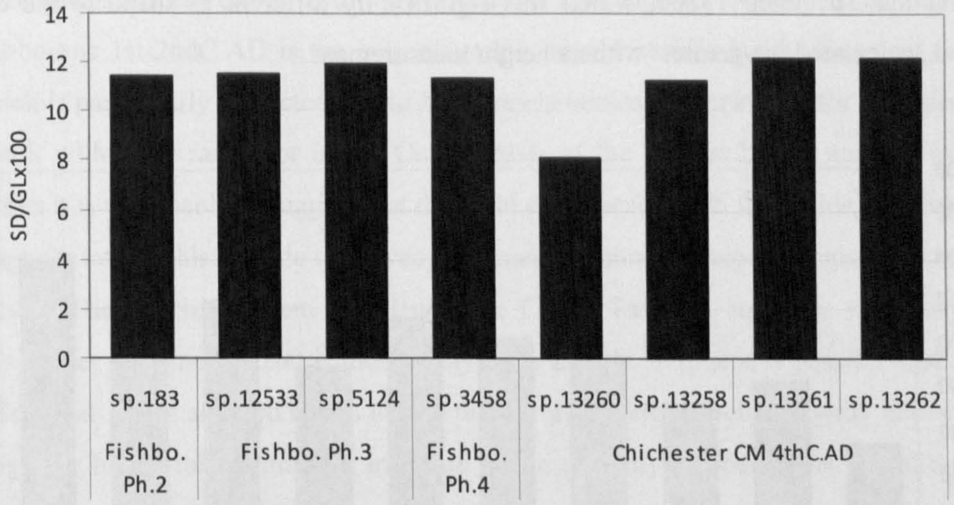


Figure 90; Shaft breadth/greatest length index of equid metatarsals from Chichester Cattlemarket.

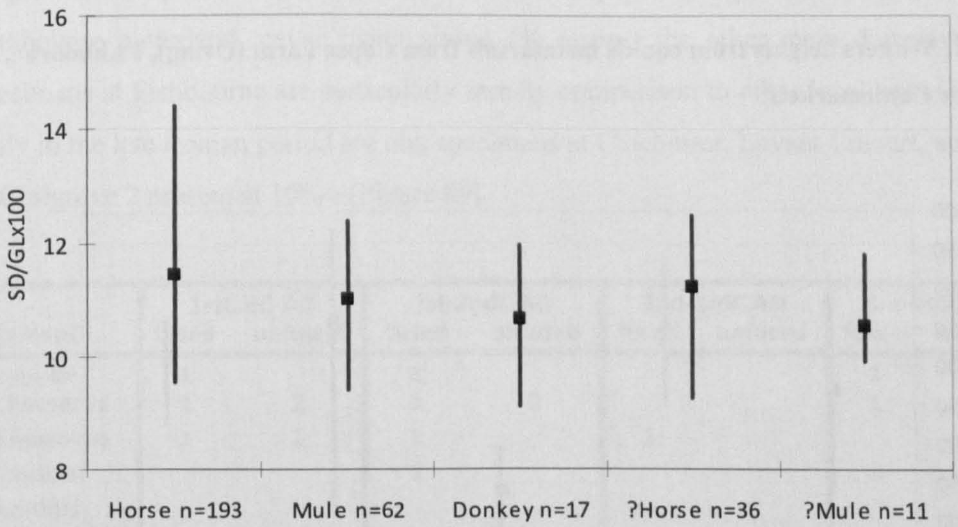


Figure 91; Mean and range statistics for shaft breadth/greatest length index of archaeological equid specimens from late Iron Age and Roman Europe (Data after Johnstone 2004, 318, fig.6.47).

Considering the conformity in shape of many of the equid metatarsals, the calculation of withers heights from the same element suggests that a range of sizes in the animals existed (Figure 92). Most significant, perhaps, is the fact that the heights of the animals increase chronologically from 'short' equids in the late Iron Age at Copse Farm (Oving) and Fishbourne 1stC.BC-AD, to slightly taller equids at early Roman Copse Farm with a further height increase at Fishbourne 1st-2ndC.AD, and finally, three of the four specimens from Chichester Cattlemarket represented the three tallest equids present in the sample. It is also interesting that specimen 13260, which was significantly different in shape to the other specimens, calculated the greatest withers height measurement.

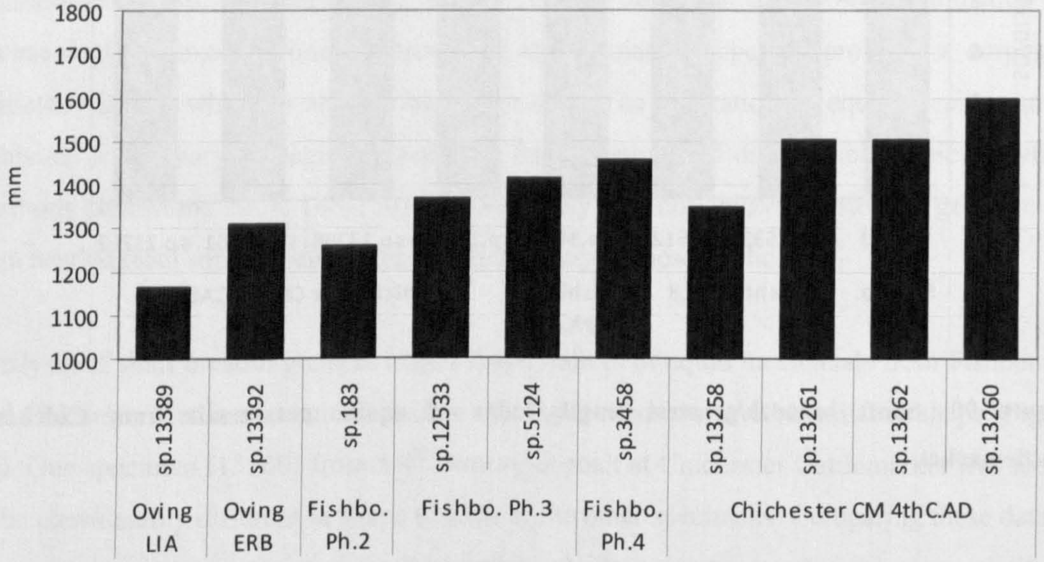


Figure 92; Withers heights from equids metatarsals from Copse Farm (Oving), Fishbourne, and Chichester Cattlemarket.

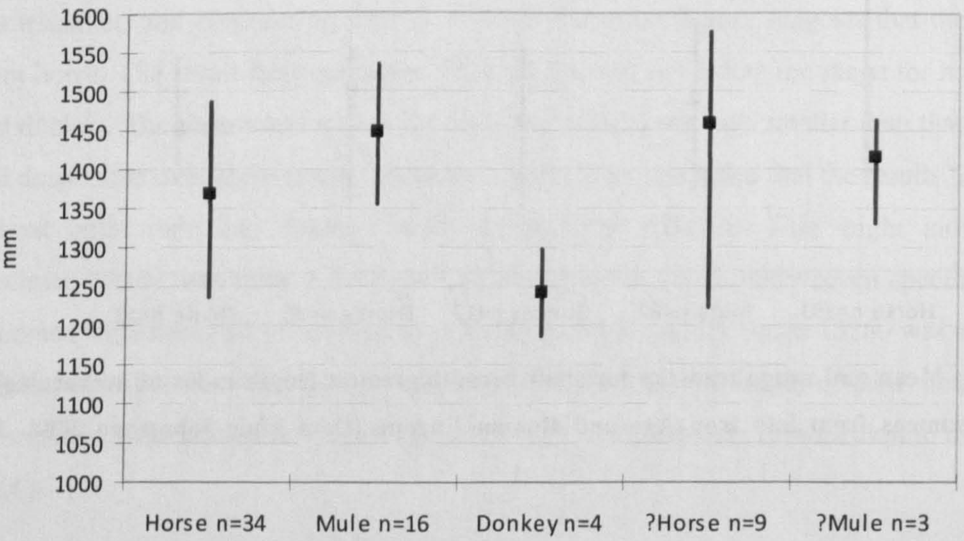


Figure 93; Mean and range statistics for the estimated withers heights of archaeological equid specimens from late Iron Age and Roman Europe (Data after Johnstone 2004, 252, fig.6.14).

When compared to Johstone's (2004, 252) mean and range statistics for equid withers heights, it can be seen that the three specimens (13261, 13262 and 13260) of greatest withers height in the sample fall outside the upper limit for horse. Specimens 13261 and 13262 are slightly above the upper limit, whereas specimen 13260 is even greater. Specimen 13389 from the late Iron Age phase from Copse Farm falls outside the lower limit of the range for horse and is instead closer to the lower limit of the range for donkey. Specimen 183 from Fishbourne 1st-2ndC.AD is the only other specimen that falls inside the range for donkey, which is particularly restricted due to Johnstone's minimal sample size for this species, but it is still within the range for horse. On the basis of the withers height and the shape index results it is reasonable to suggest that the eight specimens which fall inside the withers height range for horse (this include the seven specimens of similar shape in Figure 90) are all from horses. The specimen from late Iron Age Copse Farm is arguably a donkey and the tall/slender specimen 13260 is most likely to be a mule. Whilst it is possible that specimens 13261 and 13262 are also mules due to their withers heights being slightly above the upper range for horse, their similarity in shape to the majority of specimens would suggest that these are particularly large horses.

3.7.1.2 Canids

Dog remains, by contrast to equids, are consistently poorly represented on all sites in the Fishbourne hinterland, never rising above 4% against the other main domesticates. Dog specimens at Fishbourne are particularly rare by comparison to other local sites (Figure 88). Only in the late Roman period are dog specimens at Chichester, Lavant Culvert, and the villa at Chilgrove 2 present at 10%+ (Figure 89).

Element	1stC.BC-AD		1st-2ndC.AD		2nd-3rdC.AD		3rd-4thC.AD	
	fused	unfused	fused	unfused	fused	unfused	fused	unfused
scapula	1		1				1	
P.humerus	1	2	1	2			1	
D.humerus	1	1	1		1			
P.radius			1				1	1
D.radius								
ulna			1					
pelvis				2				
P.femur			3				2	
D.femur			1		1			
P.tibia				1			1	
D.tibia				1			1	
D.4th mt							1	

Table 24; Count of fused and unfused dog specimens from Fishbourne by Phase.

However, the presence of unfused canid remains from Fishbourne indicates that dogs were being reared on site in 1stC.BC-AD and 1st-2ndC.AD (Table 24). The presence of a pelvis and tibia recorded, both as foetal/neonatal, from 1st-2ndC.AD deposits also suggests that dogs were being bred during this phase at Fishbourne. Of the dog remains, two demonstrate cut marks. One specimen shows two quite precise incisions on the medial surface on the humerus of a small pup, indicating the severing of tendons and probably the careful removal of the front leg from the main body (Figure 94). One almost fully articulated dog was recovered from a 2nd-3rdC.AD deposit along with 3rd century coins and Nene Valley pottery. This burial was recorded in the overall assemblage as 1 dog specimen – 7887.

Figure 94; Infant dog humerus with cut marks on medial surface towards proximal epiphyseal closure. From Fishbourne 1st-2ndC.AD, *c.*AD100-140 (Photo by author).

3.7.1.3 Felids

Cat remains are very rare on sites in the area, with the earliest recorded specimens coming from 1st-2ndC.AD deposits at Fishbourne (Figure 95). A relatively large proportion of cat remains – 25 fragments in total – was recovered from Chilgrove 2 coinciding with a relatively high proportion of dog remains. Further single specimens of cats come from 2nd century deposits at Chichester Cattlemarket and the late Roman villas at Batten Hanger and Watergate Hanger.

Metrical analysis has suggested that one specimen from 1st-2ndC.AD at Fishbourne derives from a wild cat *Felis silvestris*, along with another three fragments which are instead indicative of the domestic form *Felis catus* (Sykes *et al.* 2006b, 97). It is tempting to associate the presence of cats with the black rat remains also recovered from 1st-2ndC.AD deposits, the two species having a long predator-prey relationship. Kitchener and O'Connor (2010) note that the ability of cats to attach themselves to urban sites and villas during the Roman period might have been in response to the growing presence of rodents in such areas. Certainly, feline remains have, so far, only been identified from high-status villas and a town in this area. It is also interesting to note that several cat skeletons were also recovered from late Roman wells at the military site of Porchester Castle, several miles to the east of this area (Grant 1975, 405).

Figure 95; Cat humerus from 1st-2ndC.AD deposit at Fishbourne (Photo by author)

3.7.2 Non-domestic mammals

A range of wild animals were identified at Fishbourne, including red deer, roe deer, fallow deer, hare, fox, badger and bear (Figure 96). Red deer were the most abundant in 1stC.BC-AD2nd-3rdC.AD and 3rd-4thC.AD, providing relative frequencies above 4% in each. Roe deer were generally the second most common, particularly in 1stC.BC-AD and 1st-2ndC.AD. Hare was also relatively frequent in 1stC.BC-AD and 1st-2ndC.AD, even providing the greatest frequency of remains from these species in the latter (though only 0.1% above red deer). Fallow deer also provide remains from all 4 phases of the site, albeit in smaller frequencies to the other three species; though fallow deer is better represented than hare in 3rd-4thC.AD. For some specimens it was impossible to separate between red and fallow deer due to overlaps in size and the absence of specific diagnostic elements to the bone. In these cases the specimens were identified as 'fallow/red' and most likely represent either male fallows or female reds.

Fox, badger and bear remains were also identified, present in minimal quantities from single phases: fox in 1st-2ndC.AD, with badger and bear from 3rd-4thC.AD deposits. The bear specimen is particularly interesting and is represented by a single phalanx recovered from the site at Westward House (Figure 97). The bone includes a cut mark on the dorsal surface towards the proximal epiphysis, which is suggestive that the animal was skinned after it had been killed, though we cannot be sure where this took place. Bear claws are reasonably commonplace in high-status burials of the late Iron Age in northern Europe including Britain (Meniel 2002), though the dating of this specimen seems to place this animal later in the Roman period.

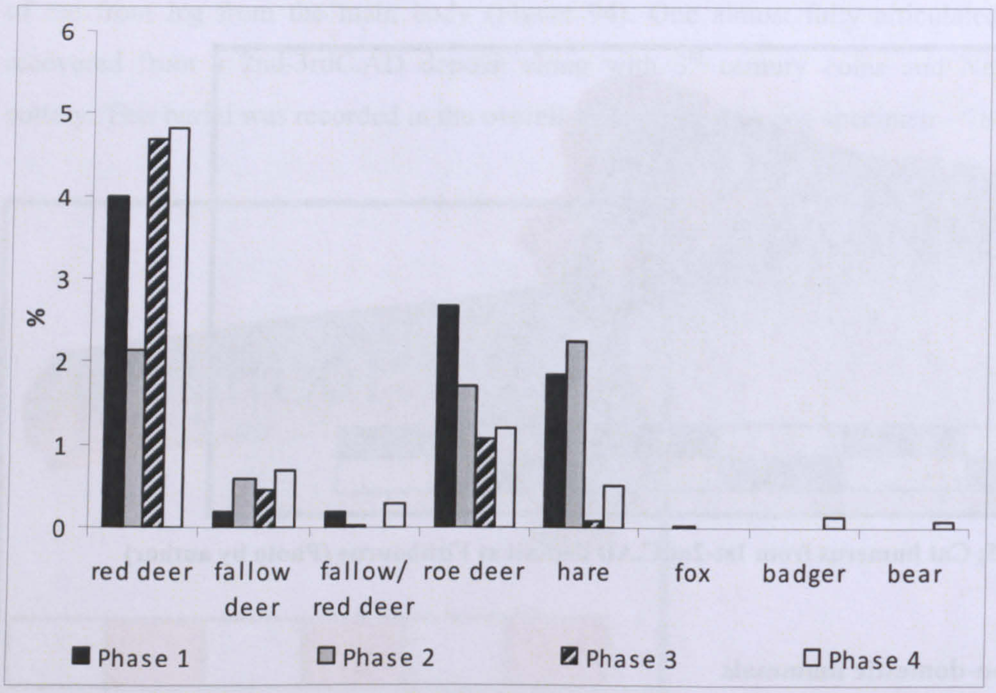


Figure 96; Frequency of 'non-domesticated mammals' at Fishbourne by phase. Percentages calculated against the total quantity of cattle, sheep/goat and pig remains plus the taxa in question.

Figure 97; Bear phalanx from ditch at Westward House, Fishbourne, *c.*3rd century AD.

The occurrence of these species on hinterland sites tends to be much rarer (Table 25). The pattern of occurrence from these sites tends to follow the relative frequency of remains from Fishbourne, in order of red deer, roe deer, hare and fallow deer. A fox specimen was identified from the Rowes Garage site at Chichester, whereas badger and bear remains were completely absent from all sites. Whilst these animals were present in the local landscape (though the context of the bear specimen is unclear) these were not engaged with to the same extent as they were at Fishbourne.

	LIA		Transitional						early Roman				late Roman						
	Copse Farm	North Bersted	Chichester Cattlemarket	Copse Farm	Hayling Island	Ounces Barn	Carne's Seat	Lavant	Chichester Cattlemarket	Chichester, Rowes Garage	Elsted	Hayling Island	Chichester Cattlemarket	Chichester, Lavant Culvert	Westhampnett	Bignor	Chilgrove 2	Watergate Hanger	Batten Hanger
Red Deer	x			x	x			x	x		x	x	x			x	x	x	x
Roe Deer					x			x	x				x	x				x	x
Fallow Deer													y	x					
Hare									x				x		x				
Fox										x									
Badger																			
Bear																			

Table 25; Recorded presence of non-domesticated mammal species on hinterland sites (includes those species identified at Fishbourne), y = specimen originally misidentified as red deer.

According to the relative frequencies of red deer and roe deer at hinterland sites these animals are especially uncommon compared to the main domesticates rarely producing frequencies of remains above 1% of the total NISP (Figure 98). Compared to Fishbourne where frequencies of red deer generally range between 2% and 5%, with those of roe deer ranging between 1.5% and 3%, this is quite a difference considering the relatively large samples from Fishbourne and the range of other animals present in the assemblages. The late Roman villas at Batten Hanger and Watergate Hanger are the only two sites in the region which generated deer frequencies above 2% of the total NISP from each site; though roe deer at Batten Hanger are still minimal (Figure 98).

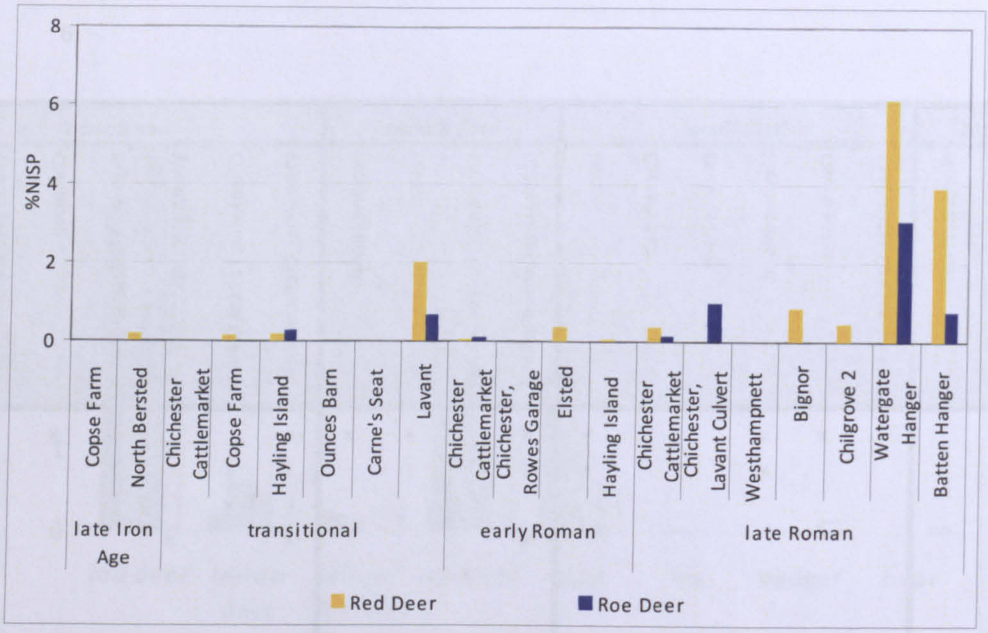


Figure 98; %NISP of red deer and roe deer remains from hinterland sites by phase.

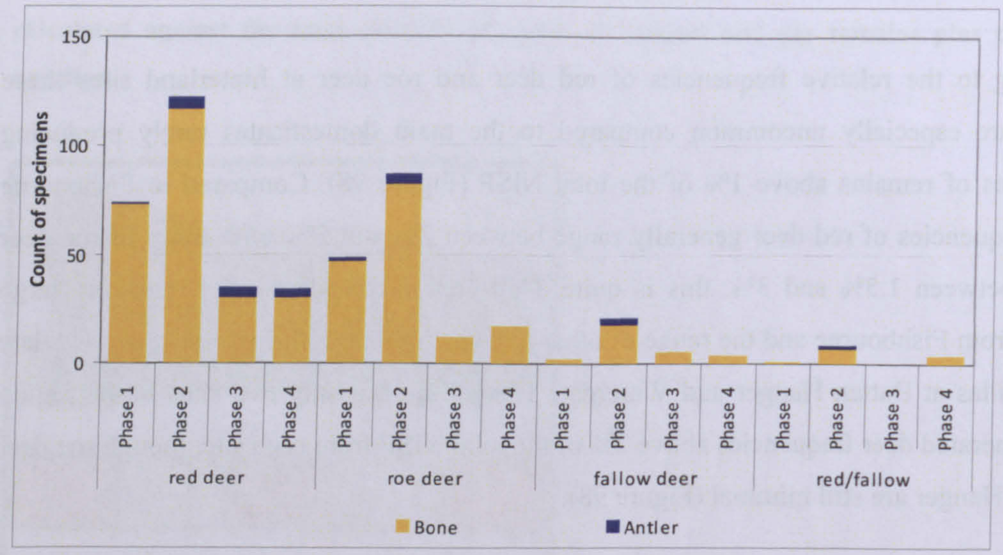


Figure 99; Count of specimens from each of the deer categories from Fishbourne by phase. The quantities of specimens are separated into bone (i.e. other than antler) and antler.

Examining the quantity of deer bone compared to antler from Fishbourne indicates that the vast majority of the remains came from post-cranial body parts rather than collections of antler (Figure 99). Based purely on the quantity of specimens, rather than relative frequencies, it would appear that deer were most commonly exploited during 1st-2ndC.AD. 1stC.BC-AD deposits generated the second highest quantity of fragments. In every phase, and from each cervid species, antler quantities are minimal by comparison to other elements. Cervid remains were also recovered as associated bone groups (see Hill 1995; Morris 2008) and were occasionally found as whole limb parts (Figure 100). The specific quantities of bone and antler are rarely reported from most of the other hinterland sites, though antler quantities recorded from the villas at Batten Hanger and Watergate Hanger suggest that post-cranial element still dominated the assemblages (Hunter n.d.).

Figure 100; Red deer ankle joint including distal tibia, calcaneum, astragalus, and naviculo-cuboid (AD43-75).

No fallow deer were identified during original analysis of the Fishbourne assemblages though my analysis has shown that a considerable quantity of *Dama* remains exist. The re-analysis of the 1960s assemblage has shown that fallow deer are relatively well represented and from a wide selection of body parts and the analysis of other Fishbourne assemblages also produced specimens relating to this species (Table 26). Sykes' (2004) review of Fallow remains in Britain indicates that this species is commonly represented by foot and antler fragments possibly linked to the trade in exotic goods rather than the presence of live animals. The range of fallow remains produced from Fishbourne suggests that this is unlikely to have been the case at this site. The wide array of post-cranial elements from my analysis alongside strontium isotope analysis of Fishbourne fallow deer teeth (Sykes *et al.* 2006a) suggests that a live herd was present at the settlement for some time.

Element	Fishbourne Assemblage FB61-68	FB92	FB95-02	FB98
antler	3 (1)		3	
skull	1			
mandible	1		2	
tooth	(1)			
scapula	1	(1)	1	
humerus			1	
radius	1			1
ulna	1			
metacarpal	6 (5)	2		1
pelvis	1			
femur	(3)	(1)		
tibia	1	1		
metatarsal	4		3	1
phalanx				2
TOTAL	20 (10)	3 (2)	10	5

Table 26; List of Fallow Deer Dama dama fragments from Fishbourne by assemblage and element (numbers in parentheses denote fragments identified as 'fallow/red').

Figure 101; Fragment of fallow deer pelvis from Fishbourne, FB60-68, *c.*AD100-140. Behind is a modern fallow pelvis for comparison (Photo by author).

Hamilton-Dyer (2004) identified a *Dama* metapodial fragment from a 3rd century deposit at Lavant Culvert and, at the time of writing, suggested that the deposit was mixed by later medieval activity purely on the basis that fallow had not been introduced to Britain at that point. This specimen can now be reconsidered as 'Roman'. Further to this, a reassessment of the Chichester Cattlemarket assemblage by the author has shown that an almost complete fallow deer antler (shed) had been misidentified as red deer, as was noted on markings in the museum storage. Beyond Fishbourne and Chichester, fallow deer remains are completely absent from all other hinterland sites; though of course there is the possibility of further misidentifications.

All cervid species show evidence of butchery marks with red deer producing fragments with marks in each phase (Figure 102). Butchery on deer remains range from cut marks, sawing on antler, to the deliberate fracturing of long bones - presumably for marrow extraction (Figure 103). One fallow deer metatarsal from 1stC.BC-AD showed evidence of skinning marks at the proximal end for the removal of the fur.

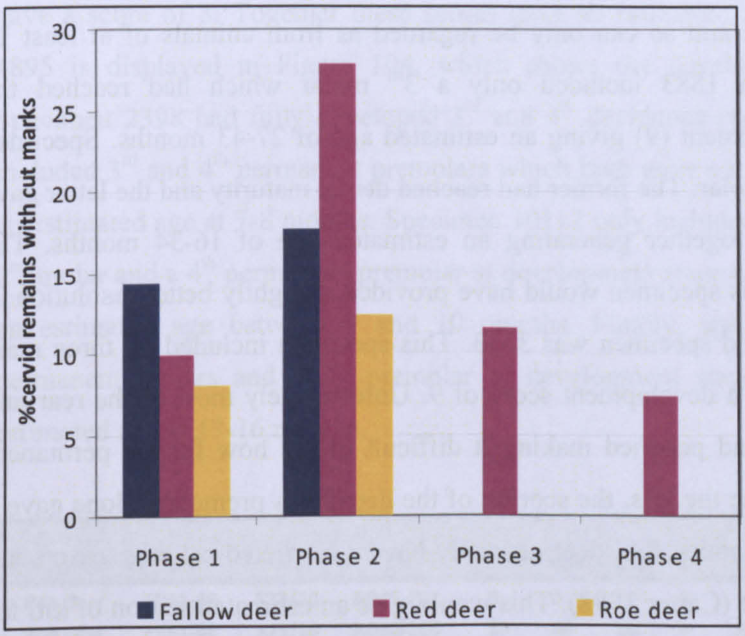


Figure 102; Frequency of butchery remains on cervid remains from Fishbourne by phase.

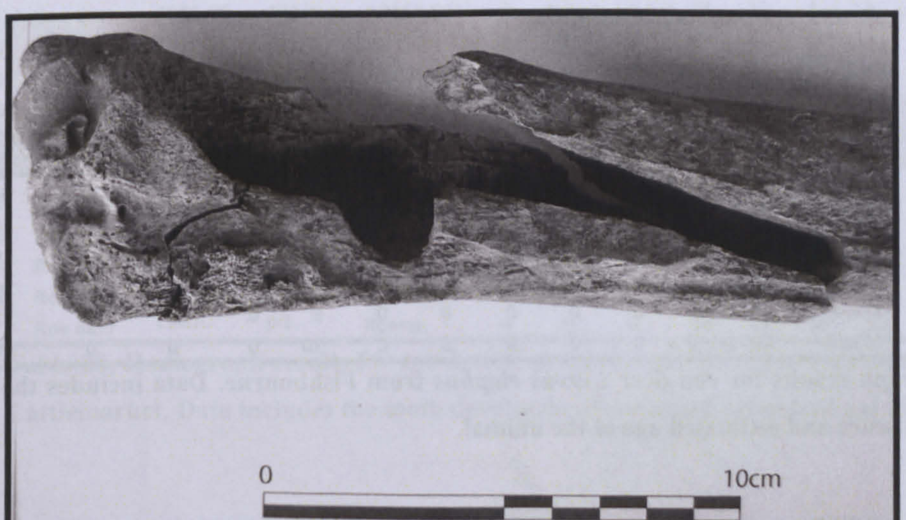


Figure 103; Red deer radius from Fishbourne with evidence of puncturing and deliberate fracture.

3.7.2.1 Deer Radiograph Results

Six red deer mandible specimens were available for radiograph analysis (Table 27). All the specimens came from Fishbourne: five from the original 1960s excavations (FB61-68) and one from the 1995-2002 excavations (FBE95-02). All the specimens came from either 1stC.BC-AD or 1st-2ndC.AD deposits. The specific dates are given in the table. One specimen, 1098, was found to have reached full dental maturity and was not able to provide a reliable result. Two specimens, 542 and 2874, included only 1st molars which were each found to be dentally mature and so can only be regarded as from animals of at least 16 months or more. Specimen 1883 included only a 3rd molar which had reached the penultimate stage of development (9) giving an estimated age of 27-43 months. Specimen 3607 included a 1st and 2nd molar. The former had reached dental maturity and the latter gave a development score of 9, together generating an estimated age of 16-34 months. The presence of a 3rd molar in this specimen would have provided a slightly better resolution in age. The most accurately aged specimen was 3553. This specimen included all three main deciduous teeth, each giving a development score of 9. Unfortunately most of the rear and underside of the mandible had perished making it difficult to see how far the permanent dentition had developed. None the less, the scoring of the deciduous premolars alone gave a mandible age between 5-8 months. Red deer normally have a restricted calving season and tend to give birth around June (Carter 1998). This would give an estimated season of kill for specimens 3553 at the end of autumn or winter. The estimated monthly ages of specimens 3607 and 1883 are too broad to provide seasonality information. These specimens are still identified to be from immature/subadult animals.

spec.	species	site	context	date	dp2	dp3	dp4	m1	m2	m3	pm2	pm3	pm4	estimated age (mths)
3553	Red deer	FB61-68	262/5	AD140-180	9	9	9	0	0	0	0	0	0	5-8
542	Red deer	FB61-68	80/8	AD100-140	0	0	0	10	0	0	0	0	0	16+
2874	Red deer	FB61-68	224/14	AD43-75	0	0	0	10	0	0	0	0	0	16+
3607	Red deer	FB61-68	262/17	AD45-75	0	0	0	10	9	0	0	0	0	16-34
1883	Red deer	FB61-68	178/4	AD75-80	0	0	0	0	0	9	0	0	0	27-43
1098	Red deer	FBE95-02	1098.2	AD75-150	0	0	0	0	0	10	0	0	0	mature

Table 27; Radiograph results for red deer *Cervus elaphus* from Fishbourne. Data includes the tooth development score and estimated age of the animal.

Sixteen roe deer mandibles were available for radiograph analysis (Table 28). Fifteen of the specimens were recovered from the 1960s excavations at Fishbourne (FB61-68) and one specimen from Chichester Cattlemarket. Unfortunately, eight of the specimens were found to be fully dentally mature as the 3rd molars had reached the final stage of development, and a further three specimens were possibly dentally mature as, although they were missing 3rd molars the other teeth present were all mature. This left 5 specimens which gave reliable ageing results. These were all from the 1960s Fishbourne assemblage: two came from 1stC.BC-AD deposits (10119 and 4779) and 3 came from 1st-2ndC.AD deposits (4895, 2398 and 10112). Specimen 10119 was the youngest aged specimen. It had a fully developed 4^{th} premolar, a 4^{th} permanent premolar at stage 1, and a 1^{st} molar at stage 8, generating an estimated age at 4-5 months. Specimen 4895 included all three deciduous premolars and each had reached dental maturity. Inside the mandible, the 3^{rd} and 4^{th} permanent premolars had both reached development stage 3. The 1^{st} molar gave a score of 9 and the 2^{nd} molar gave a score of 8. Together these scores gave an estimated age of 5-7 months. Specimen 4895 is displayed in Figure 104, which shows the development stages of each tooth. Specimen 2398 had fully developed 3^{rd} and 4^{th} deciduous premolars and 1^{st} molar. It also included 3^{rd} and 4^{th} permanent premolars which both gave a score of 5, giving the specimen an estimated age at 7-8 months. Specimen 10112 only included two teeth. A fully developed 2^{nd} molar and a 4^{th} permanent premolar at development stage 6. This was still enough to give an estimated age between 9 and 10 months. Finally, specimen 4779 had two mature permanent molars and a 3^{rd} premolar at development stage 9 giving this specimen an estimated age at 13-16 months.

spec.	species	site	context	date	dp2	dp3	dp4	m1	m2	m3	pm2	pm3	pm4	estimated age (mths)
10119	Roe deer	FB61-68	323/20	AD45-75	0	0	10	8	0	0	0	0	1	4-5
4895	Roe deer	FB61-68	323/16	AD80-100	10	10	10	9	8	0	0	3	3	5-7
2398	Roe deer	FB61-68	202/4	AD75-80	0	10	10	10	0	0	0	5	5	7-8
10112	Roe deer	FB61-68	346/14	AD80-100	0	0	0	0	10	0	0	0	6	9-10
4779	Roe deer	FB61-68	323/9	AD45-75	0	0	0	10	10	0	0	9	0	13-16
10117	Roe deer	FB61-68	323/4	AD140-180	0	0	0	10	10	0	0	0	10	?mature
10110	Roe deer	FB61-68	323/20	AD45-75	0	0	0	0	0	0	10	10	0	?mature
10111	Roe deer	FB61-68	317/3	post-AD280	0	0	0	10	10	0	10	10	10	?mature
10118	Roe deer	FB61-68	353/3	AD140-180	0	0	0	10	10	10	0	0	10	mature
651	Roe deer	FB61-68	81/4	AD180-250	0	0	0	10	10	10	10	10	10	mature
10113	Roe deer	FB61-68	178/10	AD43-45	0	0	0	0	10	10	0	10	0	mature
10121	Roe deer	FB61-68	4/8	AD43-75	0	0	0	10	10	10	0	0	0	mature
10120	Roe deer	FB61-68	330/5	AD45-75	0	0	0	10	10	10	0	0	0	mature
10115	Roe deer	FB61-68	2/5	AD75-80	0	0	0	10	10	10	0	0	0	mature
10114	Roe deer	FB61-68	399/13	AD80-100	0	0	0	0	10	10	0	0	0	mature
0	Roe deer	Chich.	pit	Roman	0	0	0	10	10	10	10	10	10	mature

Table 28; Radiograph results for roe deer *Capreolus capreolus* from Fishbourne and Chichester Cattlemarket. Data includes the tooth development score and estimated age of the animal.

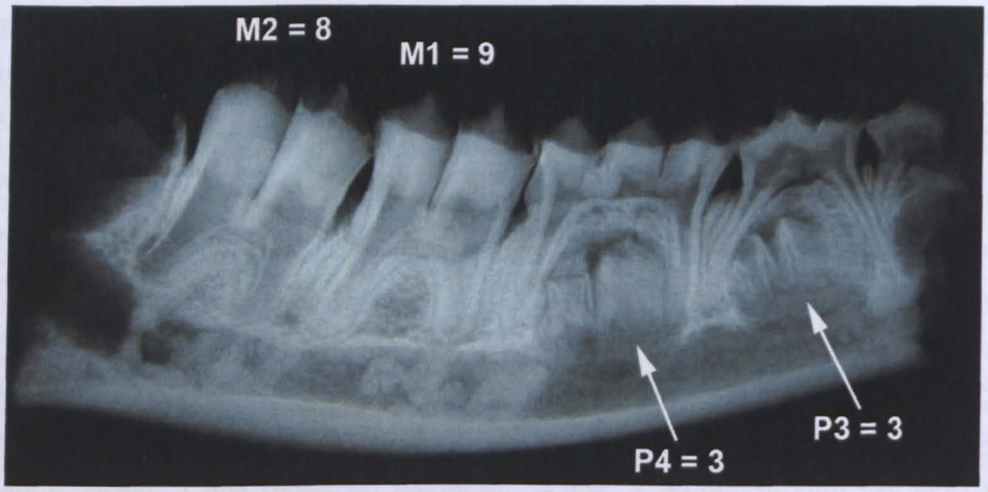


Figure 104; Radiograph of roe deer mandible 4895 from Fishbourne Roman Palace, AD80-100. Specimen has an estimated age-at-death of 5-7 months.

Roe deer, like red deer, also tend to calve around June (Carter 2001). Using this as a fixed yearly event, the five specimens that gave reliable results are able to provide information on seasonality at Fishbourne. Table 29 shows the age distribution of the roe deer specimens detailed above by estimated month and approximate season. Taking the full range of the specimen distribution this gives a roe deer 'hunting season' from July through to April, almost 10 months of the year and incorporating the entire annual seasons. If, however, we take the minimum monthly range or the most restricted distribution for which each specimen could fit, this would give a 'hunt season' between October (the final month of specimen 4779) and March (the first month of specimen 10112). This reduces the seasonality of roe deer exploitation at Fishbourne to the autumn and winter months. This reduced range would also provide a distribution which would also include the red deer mandible specimen.

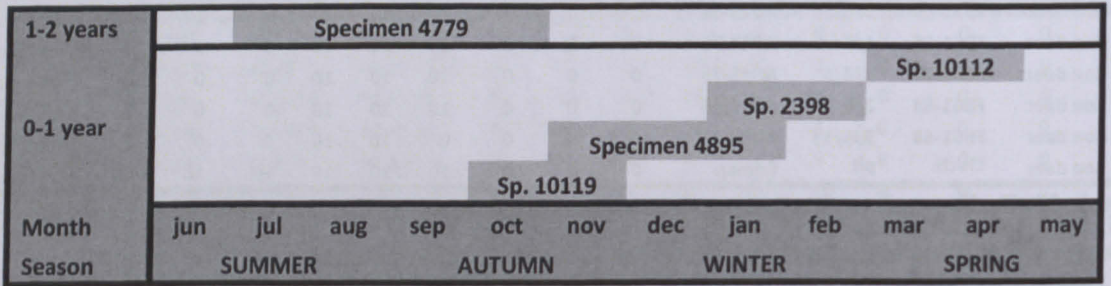


Table 29; Seasonality table of monthly ageing of radiographed roe deer specimens from Fishbourne.

3.8 Birds

At Fishbourne, 22 species of bird were identified from across the four phases of occupation (Figure 105). Chichester Cattlemarket produced 7 species of bird; Copse Farm produced 2 species, with only 1 species being identified from Carne's Seat, Bignor, and Westhampnett. As seen from the log ratio data examined in Chapter 3.3, the differences in the number of species identified between the hinterland sites can be attributed to some extent to the quantity of animal fragments making up the total assemblage, i.e. more fragments = more species.

The frequency of bird remains from most of the hinterland sites is likely to be largely under-represented. The general lack of bird remains from hinterland sites is exemplified in Table 30. Only Copse Farm produced bird remains from Iron Age phases. These were represented by 2 crow/rook specimens, whilst a single raven bone was identified from the transitional phase of the site. A species of duck was identified from the transitional phase at Carne's Seat, a significant find considering this site is considered to be a simple stock enclosure situated on the upper chalk downland (Bedwin and Holgate 1995). Chichester Cattlemarket produced 3 fragments of domestic fowl from its earliest phases, which increased in the number of species to domestic fowl, mallard, goose, and, at least, 3 corvid species. These species were added to by 4 specimens of woodcock in the late Roman phases of the site.

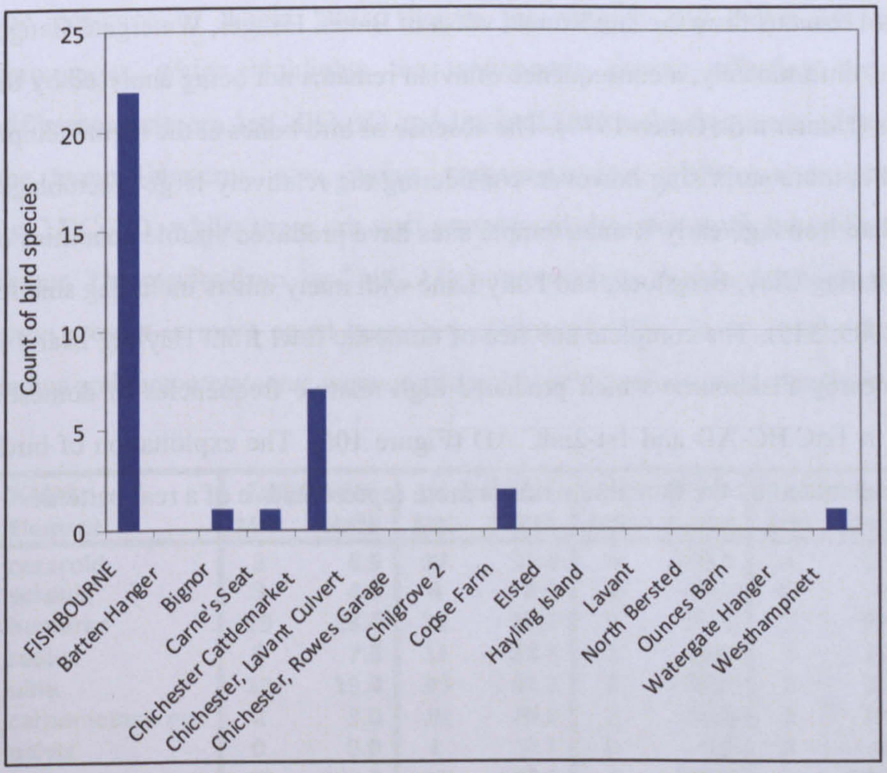


Figure 105; Count of bird species identified from Fishbourne and the hinterland sites (all phases).

PHASE	SITE	Bird	DF	MD	GS	CR	JD	RV	WC	DK
Late Iron Age	Copse Farm	x				2				
	North Bersted									
Transitional	Chichester	x	3							
	Copse Farm	x						1		
	Hayling Island									
	Ounces Barn									
	Carne's Seat	x								1
	Lavant									
Early Roman	Chichester	x	17	4	2	4	4	1		
	Chichester, Rowes									
	Elsted									
	Hayling Island									
Late Roman	Chichester	x	90	9	7	5	5	2	4	
	Chichester, Lavant									
	Westhampnett	x	5							
	Bignor	x	4							
	Chilgrove 2									
	Watergate Hanger									
	Batten Hanger									

Table 30; Presence of bird remains at hinterland sites including number of fragments by species. DF = domestic fowl; MD = mallard; GS = goose species; CR = crow/rook; JD = jackdaw; RV = raven; WC = woodcock; DK = duck species.

The absence of bird remains from the late Roman villas of Batten Hanger, Watergate Hanger and Chilgrove 2 is, unfortunately, a consequence of avian remains not being analysed by the original specialists (Hunter n.d.; Outen 1979). The absence of bird bones at the shrine/temple on Hayling Island is more surprising however, considering the relatively large assemblages excavated. Other late Iron Age/early Roman temple sites have produced sizable quantities of domestic fowl including Uley, Brigstock, and Folly Lane with many others including smaller quantities (King 2005, 335). The complete absence of domestic fowl from Hayling Island is very different to nearby Fishbourne which produced high relative frequencies of domestic fowl, particularly in 1stC.BC-AD and 1st-2ndC.AD (Figure 106). The exploitation of birds at Fishbourne demonstrated by the faunal remains is more representative of a real pattern.

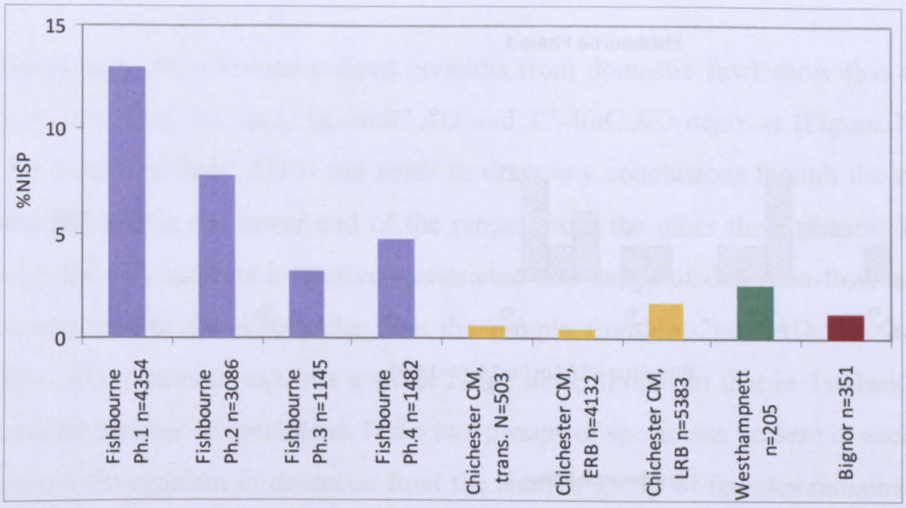


Figure 106; Relative frequency of domestic fowl remains from all hinterland sites which include this species by phase (%NISP calculated against total of cattle, sheep/goat and pig).

The relative frequency of domestic fowl by NISP is also reflected in the MNI results were a high quantity of 67 is recorded for 1stC.BC-AD which then reduces to 48 in 1st-2ndC.AD, 4 in 2nd-3rdC.AD, and a slight increase to 8 in 3rd-4thC.AD (Table 31). The femur is the best represented element in each phase. Most elements are represented in each phase indicating the presence of whole birds, though the scapula and pelvis are poorly represented throughout, which highlights the taphonomic factors affecting the assemblage. One difference between 1stC.BC-AD and 1st-2ndC.AD is the frequency of long bones other than the femur (humerus, ulna, radius, carpometacarpal, tibiotarsus and tarsometatarsus). In 1stC.BC-AD, whilst these are well represented they are much lower than the result for the femur. The results from 1st-2ndC.AD however show that the humerus, ulna and tibiotarsus were present in more equal quantities compared to the femur, whilst the carpometacarpal, radius and tarsometatarsus were considerably better represented compared to 1stC.BC-AD.

%MNI	1stC.BC-AD		1st-2ndC.AD		2nd-3rdC.AD		3rd-4thC.AD	
Element	MNI	%MNI	MNI	%MNI	MNI	%MNI	MNI	%MNI
coracoid	3	4.5	17	35.4	4	100.0	4	50.0
scapula	3	4.5	4	8.3	1	25.0	0	0.0
humerus	19	28.4	38	79.2	3	75.0	7	87.5
radius	5	7.5	11	22.9	1	25.0	2	25.0
ulna	13	19.4	39	81.3	2	50.0	2	25.0
carpometacarpus	2	3.0	10	20.8	2	50.0	2	25.0
pelvis	0	0.0	1	2.1	0	0.0	0	0.0
femur	67	100.0	48	100.0	4	100.0	8	100.0
tibiotarsus	15	22.4	45	93.8	3	75.0	6	75.0
tarsometatarsus	9	13.4	19	39.6	2	50.0	1	12.5

Table 31; MNI and %MNI results for domestic fowl from Fishbourne by phase.

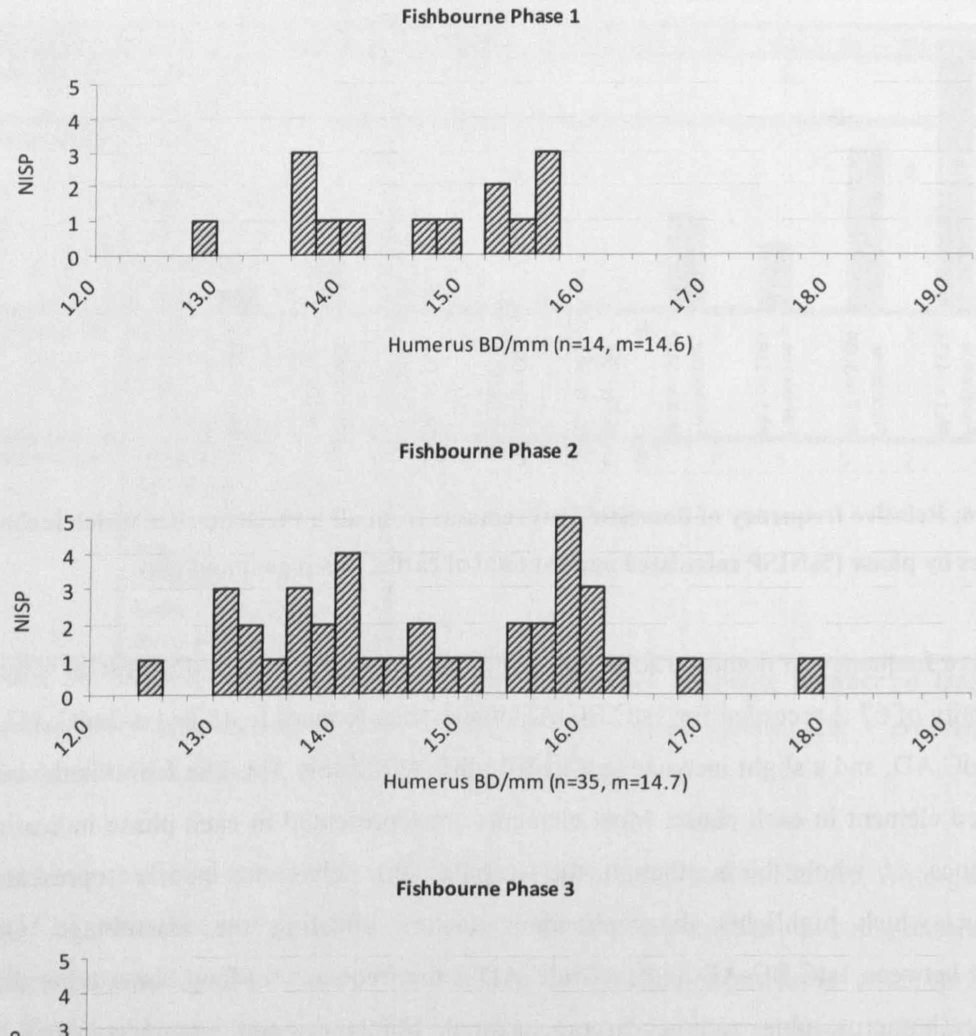


Figure 107; Histograms of domestic fowl humerus measurements (breadth of distal end) from Fishbourne by phase.

Metric data from humerus distal breadths from domestic fowl show that two groups were present in 1stC.BC-AD, 1st-2ndC.AD and 3rd-4thC.AD deposits (Figure 107). The sample size from 2nd-3rdC.AD is too small to draw any conclusions though the two specimens in this fall within the lower end of the ranges from the other three phases. The sample from 1stC.BC-AD indicate a relatively restricted size range of domestic fowl were present. The sample size is clearly smaller than the sample from 1st-2ndC.AD. The sample from 3rd-4thC.AD, however, exhibits a wider range more similar to that in 1st-2ndC.AD despite the smaller number of specimens. If the two groups of specimens present in each phase represent sexual dimorphism in domestic fowl the smaller group of females remains within the same range throughout the four periods. The larger group possibly show a gradual increase in size over time. The presence of a sexually dimorphic population is better demonstrated by measurement of the distal breadth of femurs (Figure 108). Whilst the distinction between metric groups is not as marked as with the humeri distal breadths, the presence of medullary bone in the measured femur specimens is clearly only found in the left-hand cluster of biometric data.

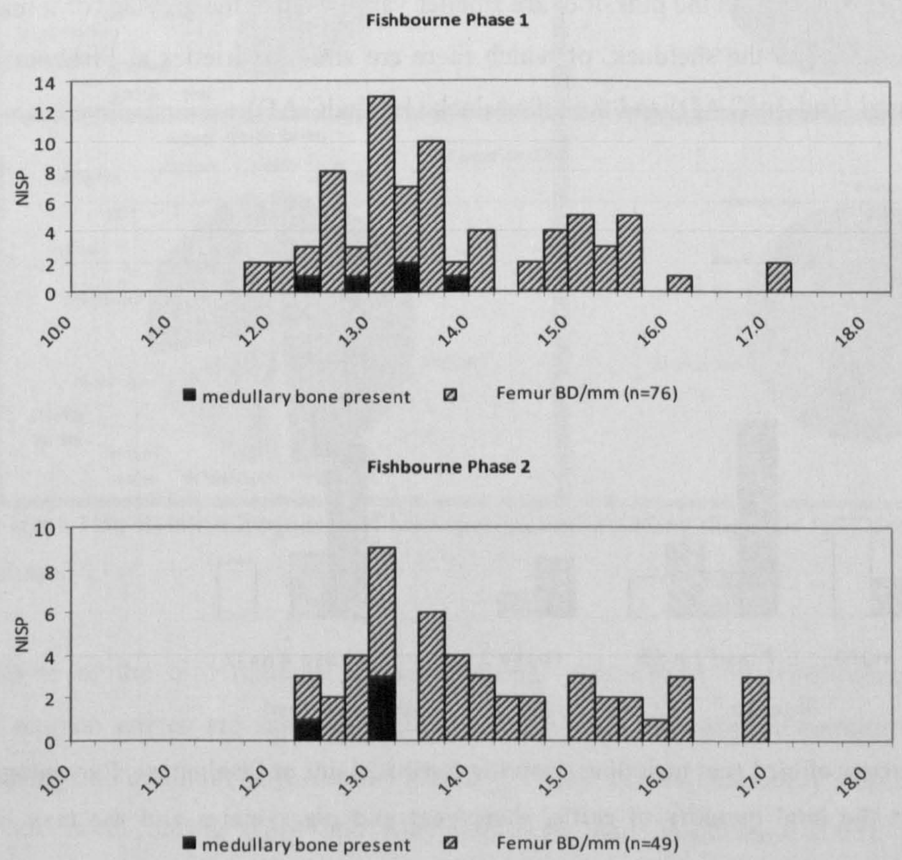


Figure 108; Histograms of domestic fowl femur measurements (breadth of distal end) from Fishbourne by phase. Those specimens with evidence of medullary bone are indicated by black squares.

The relative frequency of bird remains other than domestic fowl at Fishbourne demonstrates the importance of exploiting the wetland areas to the south of the site as ducks, geese, and waders are represented (Figure 109). Albarella's (2007) synthesis of duck and goose remains from Romano-British sites led him to believe that systems of husbandry had not developed for these birds due to low frequencies of each on most sites, despite their relatively widespread occurrence. This interpretation was largely based by comparison with the situation in the medieval period where geese in particular are much more common on most sites. According to Albarella (*ibid.* 256) the predominance of duck occurring on Roman-dated sites was, by comparison, the result of capturing wild birds. This hypothesis is well founded for Fishbourne hinterland sites where the remains of both have only been recovered from Chichester Cattlemarket, with one other site, Carne's Seat, producing a duck specimen. Pliny (*Hist. Nat.* 10.29) notes that '[t]o the goose kind belong the Sheldrake and the barnacle-goose, the latter the most sumptuous feast that Britain knows, both rather smaller than the domestic goose.' At Fishbourne the barnacle goose is present as well as the pink-footed goose and the greylag (Figure 110) – the domesticated form which Pliny (*ibid.*) refers to. It is possible that the Sheldrake refers to is another variety of goose, such as the pink-footed (indeed the barnacle and the pink-foot are smaller varieties than the greylag) or it may be a large duck similar to the shelduck, of which there are similar varieties at Fishbourne such as the pochard (2nd-3rdC.AD) and the tufted duck (1st-2ndC.AD).

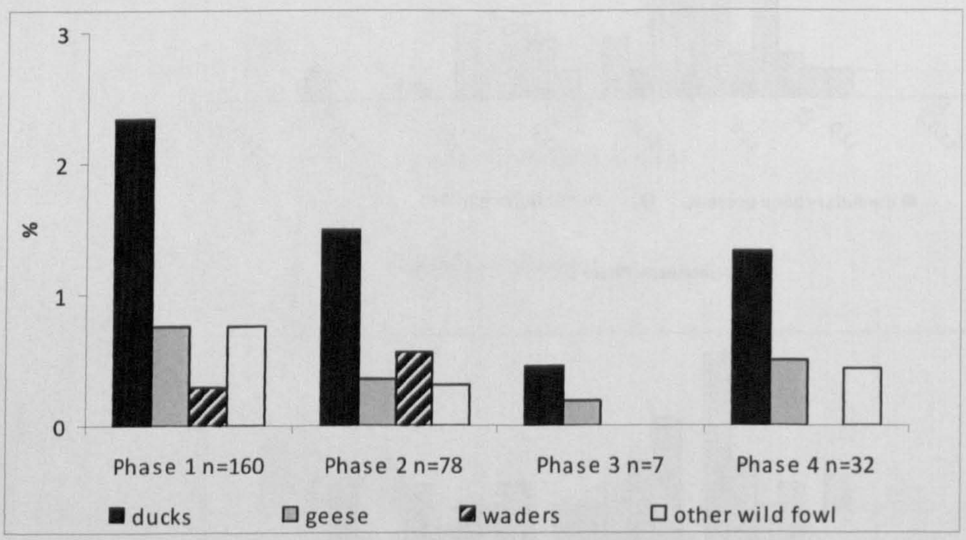


Figure 109; Frequency of bird (not including domestic fowl) remains at Fishbourne. Percentage calculated against the total quantity of cattle, sheep/goat and pig remains and the taxa in question.

Figure 110 displays the apparent discrepancy in the diversity of bird species exploited at Fishbourne between 1stC.BC-AD/1st-2ndC.AD compared to 2nd-3rdC.AD/3rd-4thC.AD where fewer species were recovered. This could be due, once more, to a decreased assemblage size. The latter phases still produced species which were not identified at other sites in the hinterland, such as the pochard and the woodpigeon. Mallards are the best represented non-domesticated bird taxa in each phase (Figure 110). Whilst both 1stC.BC-AD and 1st-2ndC.AD produced a wide variety of bird species, in 1stC.BC-AD there is a greater prevalence of larger aquatic birds, including 3 species of goose, common crane and the spoonbill. The 1st-2ndC.AD assemblage focuses more on smaller waders, including 5 species of duck, teal, and moorhen. Cranes, woodcocks and woodpigeons are present in both early phases with the latter also featuring in 3rd-4thC.AD.

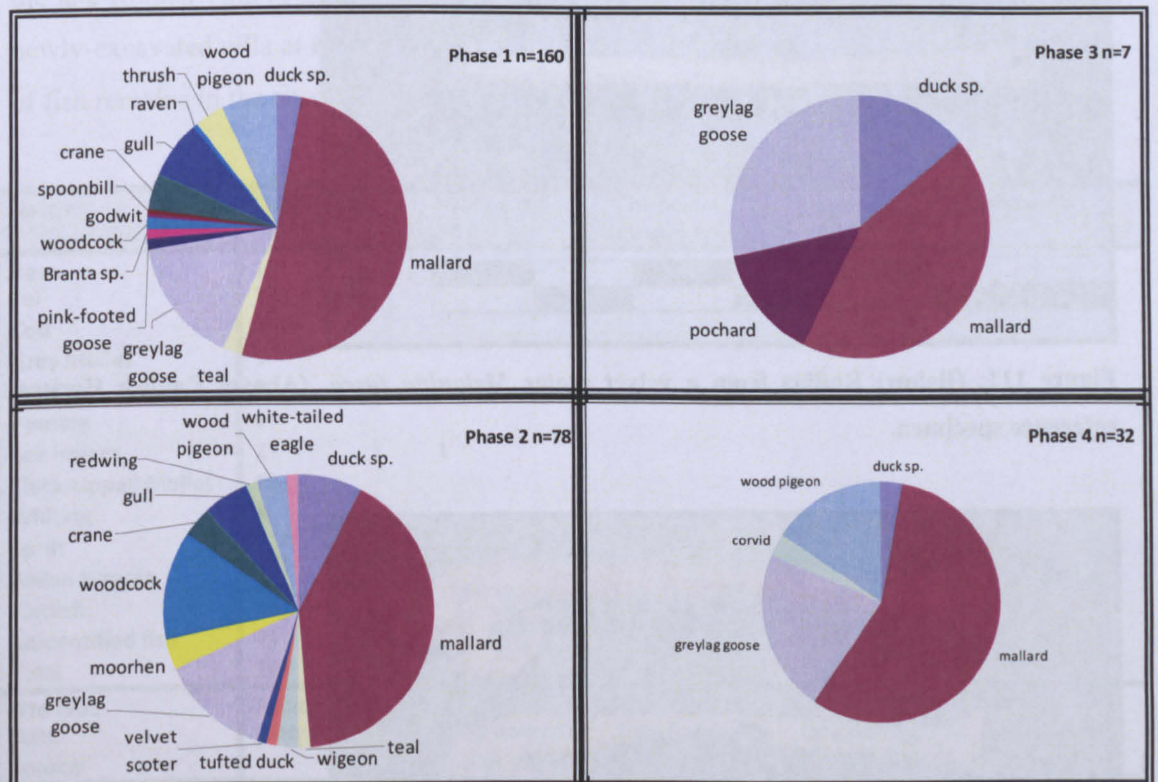


Figure 110; Relative frequency of bird species, not including domestic fowl, from Fishbourne by phase.

Some of the bird remains provide seasonal information on wildfowling at Fishbourne. Common cranes are summer visitors and are known to nest in northern Europe between spring and autumn (Serjeantson 1998, 24). Today, cranes commonly stop over on their way back north during April and May (Mathews and Macdonald 2001). The specimens recovered at Fishbourne were all adult males (see Chapter 2.1), so may have been passage migrants leaving after mating in the summer. Autumn is 'classic' wildfowling season in the northern hemisphere when a variety of wintering birds come in. Pink-footed geese are winter migrants from Northern Islands flying south in October. The velvet scoter specimen is represented by a proximal radius (Figure 111). This bird does not breed in Britain but is a winter visitor to estuarine areas in the south and east of the country (Serjeantson 1998, 24). The pochard and the tufted duck are represented by a tibiotarsus and a humerus (Figure 112) respectively. The *Aythya* ducks are both residents in Britain though their numbers dramatically increase during late autumn/early winter for breeding when larger flocks of these birds gather. Serjeantson (1998, 25) notes that the autumn wildfowling season commonly takes advantage of the influx of wintering birds and is augmented by resident wildfowl such as the woodcock.

Figure 111; (Below) Radius from a velvet scoter *Melanitta fusca*. (Above) English Heritage reference specimen.

Figure 112; (Below) Humerus of a tufted duck *Aythya fuligula*. (Above) English Heritage reference specimen.

3.9 Fish

At first sight, the discrepancy in fish remains identified from Fishbourne compared to hinterland sites is striking (Table 32). Excavations at Fishbourne produced a total of 163 fish specimens with the vast majority deriving from 1st-2ndC.AD deposits. Fish are one class of vertebrates which suffer from poor recovery where sieving strategies are not in place on excavations. The assemblages from later excavations at Fishbourne were the only ones in the area where sieving took place and this seems mostly to have affected the quantity of fish remains recovered. However, even where sieving has not taken place, small quantities of fish are still recovered. For example, a ballan wrasse maxilla was identified from FB87-88 at Fishbourne, sea bream from Hayling Island, a small quantity of fragments from sprats were recovered from the Chapel Street excavations in Chichester, and an eel vertebra came from the late Roman villa at Bignor. Furthermore, a recent assessment of the faunal remains at a newly-excavated villa at Blacksmith's Corner, Walberton, has also produced a small quantity of fish remains in the absence of sieving techniques.

Species	Fishbourne	Hayling Island	Chichester, Chapel Street	Bignor	Walberton
Bass	15				
Eel	17			1	
Cod	4				
Grey Mullet	5				
Herring	4				
Pouting	1				
Sea bream	2	1			
Thick-Lipped Mullet	13				
Whiting	4				
Sprat			+		
Ballan Wrasse	1				
Flatfish	56				
unidentified fish	41				2
Total	163	1	+	1	2
Site type	Palace	Temple	Town House	Villa	Villa
Date	Early Roman	Early Roman	Late Roman	Late Roman	Roman
Source	-	Locker unpub.	Locker 1981	Parfitt 1995	Allen unpub.

Table 32; Species table of fish including number of specimens identified from local hinterland sites.

The trends noted so far would indicate that inhabitants at Fishbourne exploited fish sources more than other local people. This is also indicated by the site's proximity to the sea and the river inlet. It is true, however, that the number of contexts which yielded fish remains at Fishbourne was very few. There is one exceptional context, 1098 (known as the 'oyster gully'), dating from 1st-2ndC.AD which was sampled during the final year of excavation in 2002 producing 156 fragments of fish bone; over 95% of the total fish remains from this site (see Sykes *et al.* 2006b, 97). Whilst this deposit is exceptional for its quantity of fish remains it must be noted here that this context was the only one to be intensively sampled compared to all others on site (see *ibid.* 99). The vast majority of the fish bones from 1098 were identified as flatfish, plaice and flounder, with eel, bass, and mullet being the next best-represented species. Sykes *et al.* (*ibid.* 101) argue that the small fish could have derived from locally-produced fish sauce, garum, based on historical records describing manufacture, though concede that the larger species such as eel, bass, and flatfish are unlikely to have been from garum and are more likely to be locally-caught fresh fish. Each of the species recovered from Fishbourne frequent estuaries either continuously or, at least, temporarily for mating (*cf.* Locker 2006; Wheeler 1969).

3.10 Discussion

The results from the analysis of the faunal remains indicate that Fishbourne was a very different site in terms of animal exploitation compared to other contemporary sites in the hinterland. Many of the data presented here follow the patterns highlighted by previous zooarchaeologists who have examined parts of the assemblage such as the high frequencies of pig remains (Grant 1971; Sibun 2003; Sykes *et al.* 2006b). There are, however, shifts in domesticate frequencies, most notably from a pig-dominated assemblage in 1stC.BC-AD and 1st-2ndC.AD towards greater proportions of cattle. 2nd-3rdC.AD/3rd-4thC.AD saw a substantial reorganisation of the earlier Palace into a complex of several smaller buildings, possibly more in keeping with other contemporary Romano-British villas in the area such as Bignor or the Chilgrove sites (see Rudling 2003; Russell 2006). It seems that the wealth of the inhabitants was not as great as it was in the earlier phases. Whilst the site remained indicative of high-status inhabitants it seems to have been inhabited by people whose social and economic outlook was more in-keeping with other local settlements. On this basis, it can be postulated that the site was a very different place, both physically and conceptually, in the first two phases to the one that existed in the latter two phases. The identification and quantification of different animal groups seems to run parallel to this change. The variation in the number of species reduces after 1st-2ndC.AD, particularly in the frequency of bird and fish taxa. Alongside the increasing frequency of cattle remains is an apparent shift in cattle husbandry, as indicated by cattle ageing data. Although entire herds are represented in both phases, there seems to be a changing focus from calves towards older animals. This may suggest an economic shift from milk and meat production towards greater use of cattle in traction.

One aspect of the data so far is the inference that Fishbourne was not solely a 'consumer' site. It has long been assumed that the luxurious status of the settlement has meant that it was concerned with importing the best produce for the inhabitants. Grant (1971, 387-388) stated that it was not a matter of simply eating what was immediately available and that the importance and resources of Fishbourne would mean that food was continually supplied to the Palace to reflect the tastes of the owners. Sibun (2003, 130) agreed with this view stating quite categorically, 'It is a consumer site, displaying a preference for a Roman-style diet and importing the best quality produce.' Sykes *et al.* (2006b, 100-101) were the first to recognise the possibility of pig-rearing on site, though maintained that cattle and sheep continued to be provisioned to the site. It is true that the evidence for cattle and sheep breeding reduces by 3rd-4thC.AD, though this could be reflection of reducing sample sizes. The presence of neonatal remains of all three domesticates during 1stC.BC-AD and 1st-2ndC.AD when the settlement held true 'elite' status indicates that the inhabitants were involved with, or at least controlled, breeding and herd management systems run from the settlement itself. The identification of both male and female domestic fowl, along with the presence of medullary bone, suggests that these animals were also being bred onsite. There is little evidence that domestic fowl are intensively bred on sites prior to the Roman period (Maltby 1997), and the high frequencies of this bird at Fishbourne suggests that this practice may have developed from an early phase at this site. The evidence suggests that Fishbourne was never simply a consumer site, but a complex high-status site involved with the production, storage and consumption of animals. The 'importance and resources' of the settlement which Grant (1971, 130) argues to have enabled Fishbourne inhabitants to bring in the best animals misses the fact that it was living herds of animals at Fishbourne itself which went some way to demonstrate the importance and resources of the site.

Animal breeding does not seem to be restricted to only the main domesticates. The continual increase in size in horses through time also hints at the possibility of animal breeding. Large horses were seen to be closer to the 'Roman ideal' according to the classical sources (Johnstone 2004, 38). If the advice from agronomists became mainstream, then the selection of the largest equids for breeding would result in a general size increase over time (Mackinnon 2001, 661; 2010, 65). The presence of neonatal canid remains suggests dog-rearing and the presence of medullary bone in domestic fowl bones highlights the existence of egg-laying. Also, the presence of many unbroken domestic fowl bones means that medullary bone frequency is likely to be underrepresented.

Our understanding of seasonality at Fishbourne has also improved. The results from the radiograph analysis of sheep/goat mandibles indicate that Fishbourne and Chichester may have been economically tied through the production and trade of young lambs, whilst the same may also have been true of piglets. The seasonality data, particularly from pigs, hints that the kill season of these animals was not as limited at Fishbourne as they were at Chichester. Culling of pigs was largely taking place throughout the year at Fishbourne whereas it was more constrained to autumn and winter at Chichester, and may indicate the role of meat preservation at early Roman Chichester. This would have been a real possibility considering the contemporary extraction of salt is well known in this area from the estuaries (Bradley 1969; Hathaway pers. comm.).

So far, this data has only been presented and discussed in a very traditional way, highlighting economic factors and activities. Understanding the landscape of Fishbourne and the social identities of the people who lived there is not a straightforward venture. The nature of the settlement is geographically and chronologically complex, with existing knowledge of the site developed through decades of excavation. Considering the uniqueness and importance of the site, both today and in the past, it has been necessary to review the evidence – the environmental setting; the production of the data – in order to contextualise the settlement as we currently understand it. This chapter has provided a range of reliable results for a well-identified assemblage. Whilst it has not significantly changed our understanding of Fishbourne from what had been interpreted from the 1960s, the assemblage has now been brought up-to-date using modern methods of analysis. There is now detailed information on ageing, biometrics, and butchery which have provided a useful dataset. Unlike many zooarchaeological reports, the aim of this thesis is to move on from this stage by examining the role of animals in the landscape. The next chapter seeks to take the information generated in this one and view it in terms of spatial patterning at the site and inter-site level by focusing more generally at how humans and animals worked together to create landscape on a local scale from the Iron Age to the Roman period, dealing with ideas involving place, experience and memory.

Chapter 4: Landscapes of Dwelling

In the previous chapter, zooarchaeological data from Fishbourne were analysed in a traditional manner. Whilst this study and others of its kind provide useful data, they offer a rather static impression of past human-animal relationships whereby animals are objectified as separate from the human population and are, therefore, irrelevant to landscape. In reality this is unlikely to have been the case, the relationship being far more intimate. In this chapter I wish to investigate the interplay between humans, animals and their landscape at the micro-level; that is, the settlement of Fishbourne itself. In an attempt to highlight and understand the patterns of daily practice through which the people and animals of Fishbourne created and shaped their immediate landscapes, I will examine spatial patterning in the zooarchaeological evidence. Pitts (2007, 701) has argued that it is through daily practice that identity is formed and thus by considering spatial patterning and human-animal-landscape relationships at the micro-level it may be possible to identify shifts that accompanied the Iron Age to Romano-British transition, if they exist.

The idea of examining spatial patterning is not new. King (1985) carried out a spatial analysis of bone patterning at the complex Roman villa at Settefinestre, demonstrating the role of different animals in different activities between areas of the site. Sites of Iron Age and Roman date tend to be quite complex with a range of feature types from which faunal remains are recovered and King's (*ibid.*) work highlighted the difficulties involved in the exercise. The most in-depth study of spatial patterning of animal bone is Wilson's (1996) multi-period examination of sites in the Upper Thames Valley. His work showed the complex affects of taphonomic and stratigraphic factors on patterns of bone positioning through site formation processes. The effects of contextual differences on assemblage variability have been equally demonstrated and documented by many other scholars (*cf.* Meadow 1975; Maltby 1985b; Hill 1995; Wilson 1996) and indeed I have further raised the point for Fishbourne already in Chapter 3.3. Maltby (*ibid.*, 40-53, 65-66), in particular, has highlighted the contextual patterning of different skeletal elements from domesticates at both Iron Age and Roman-British settlements, arguing that the distribution of the bone was a result of, both, cultural attitudes towards animals alongside the social and spatial organisation of settlements.

However, analyses of this type have tended to be limited, with few managing to articulate economic patterns with the social concerns of the community, a point which Wilson (1996, 85-87) rose towards the end of his book, echoing Maltby's (1985b, 67) earlier call to move beyond traditional palaeoeconomic reconstructions and develop knowledge of the social relationships between people, animals and their environment. There is a growing recognition that to achieve such an understanding it is necessary to consider not simply animal bones in terms of their final resting places (e.g. their context of deposition) but in terms of all the human-animal relationships that led to their eventual deposition. For instance, although Wilson's (*ibid.*) research highlighted the economics of bringing an animal to a site, killing, butchering, consuming, and depositing it, these economic 'stages' have far more to say about human-animal relationships, social practice and worldviews than has previously been stated. The stages of human-animal interaction are, and always have been, part of the same process: a continual cycle of time. By 'reattaching' these junctures, zooarchaeologists should be able to show that animals are embedded within social life (*cf.* Ingold 2000, 314; Latour 2005, 159-164).

Other scholars have clearly recognised that humans and animals live together on a daily basis and are part of the same society (*cf.* Clutton-Brock 1994). Mullins (1999, 202) notes that even in non-western societies where humans and animals are perceived as being in opposition, the boundaries between the two are seen to be fluid, with many animals thought of as people or capable of personhood. Separately, people and animals are not 'social'; it is the associations between them which generate the 'social' (*cf.* Latour 2005, 3-7). Furthermore, the role of place is essential to understanding human/animal dwelling because all actions are carried out within spaces, such that they provide the context for the action itself (*cf.* Tilley 1994, 17-20). By this rationale, continual interaction between people and animals creates the space in which they took place. Human-animal relations, therefore, generate experiences and memories and, in effect, turn 'spaces' into 'places' (Sykes 2010, 19-20; Allen and Sykes forthcoming).

Although, ideally, I would like to place emphasis on the relationship between humans and 'living' animals, it is an inescapable truth that excavated contexts are death deposits and much of the analysis in this chapter will relate to issues of carcass processing, distribution, consumption and disposal. Although these acts represent only a fraction of the total human-animal relationships, they do reflect intense sensory interactions through which people experienced animals and their landscapes. How, when and where animals were butchered, distributed, consumed and discarded would have helped to structure and shape the local landscape and therefore give meaning to human (and animal) worlds (Sykes 2010, 21).

It is these micro patterns that I wish to explore for the settlement at Fishbourne in order to see if behaviour and human-animal-landscape relationships changed through time. Such an ambition, however, is not easy to achieve, especially given the state of the archive with which I was working: the 1960s assemblage was boxed not by context but rather by 'period', thus any evidence relating to spatial patterning was lost. To re-discover this information it was, therefore, necessary to sort through the entire assemblage and reconstitute it by context – a very lengthy process. Having achieved this, it was necessary to determine from where on the site they derived. Again this involved considerable archive work, sifting through and examining all the original paper records: notes, plans and sections. To assist with the spatial analysis, I digitised the site plans and these digital records are used throughout this chapter as I attempt to reintegrate the animals with their landscape. However, humans and animals do not create 'place' alone; it is clear from the work of Hill (1995) and Moore (2007) that material culture is an equally active agent in cultural landscapes and, therefore, it is essential to consider artefacts if we are to gain a wider understanding of human-animal-landscape relationships on settlements.

In this chapter I aim to unite these different strands of evidence to provide greater resolution for understanding how human-animal-landscape relationships changed through the course of the Iron Age/Romano-British transition, thus providing new insights into the period itself. I will start by undertaking a spatial analysis of the Fishbourne assemblage by phase. This will be followed by a short analysis drawing together some of the evidence relating to butchery practices, to see how patterns changed through time.

4.1 The Faunal Landscape at Fishbourne

During the last fifty years over 400 trenches have been dug at Fishbourne and the locations of the main excavations have been given in Figure 1 (Chapter 3.1). The animal bones have derived from a wide variety of contexts and features and comparisons between the different assemblages, both spatially and temporally, are retarded by differences in bone preservation, excavation and recovery techniques, dating and samples size (for further details see Chapter 3, sections 1 and 2). Despite these problems, the Fishbourne assemblage represents an excellent opportunity to examine how human-animal-landscape relationships altered through the course of the settlement's history, a period which saw a great deal of architectural change, as is illustrated in Figure 113, which shows how the main features from the central part of the site developed by phase.

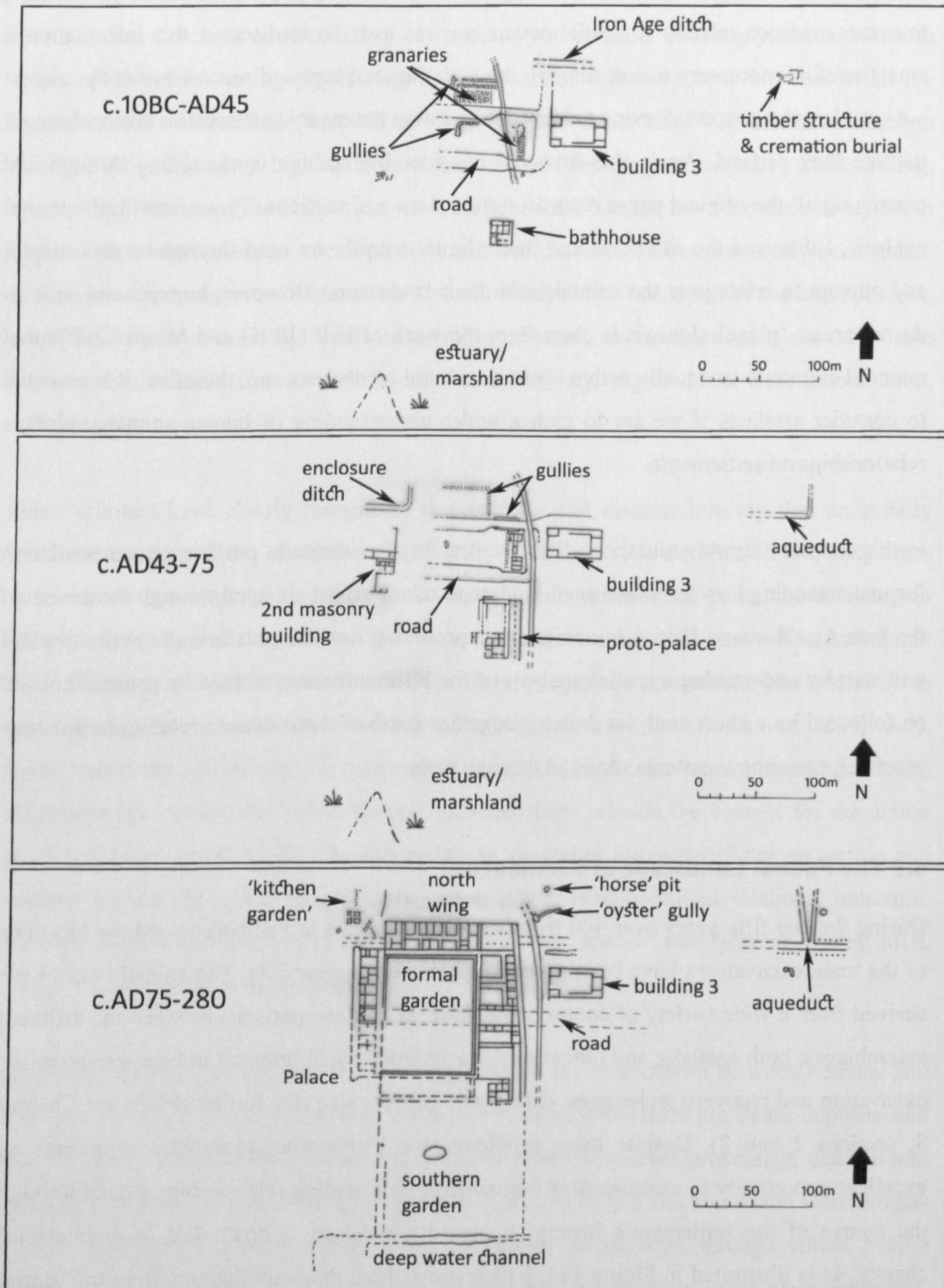


Figure 113; Plan of development at the centre of the settlement by phase showing the locations of the main features (redrawn after Cunliffe 1971; Cunliffe *et al.* 1996; Kenny 1992; Manley and Rudkin 2003; 2005; 2006) Note: substantial changes were made to the main Palace building during the 2nd century AD though the plan of the site remains similar.

4.2 Iron Age deposits: c.10BC-AD43

The form and functions of Iron Age settlements in southern Britain are generally well known and the combination of roundhouse, farm compound, and storage pits are a reflection, albeit a coarse one, of the daily movement and practices of the people who dwelt within them (Jones 1986 106-108; Cunliffe 1973). Unfortunately, no extensive settlement patterns exist for Iron Age Fishbourne; indeed very little is known about the site in this period; though for an excellent survey of the available evidence see Creighton (2006, 54-61).

The uppermost plan in Figure 113 gives the main features of site as they might have looked in plan during the settlement's earliest phase (*c.*10BC-AD45 – note there is some overlap in the phasing of different features). The only feature in this site plan which has been securely dated to the Iron Age is the large ditch in the northern area of the site, which was excavated in 1999 and 2002, and produced quantities of imported pottery that dated the primary silt deposits to 10BC-AD25 (Manley and Rudkin 2005, 61; Lyne 2005, 74). It is from these primary silts that quantities of animal remains were recovered, and which were originally examined by Sykes (2005). An additional area produced very early material, albeit in minimal quantities from a single pit deposit. About 150m to the west of the Iron Age ditch, the excavation at Westward House (FB92) unearthed a number of seemingly very early features, which produced pottery types (e.g. a butt beaker and fragments of Arretine ware) that are also found in the ditch, suggesting that it is likely to be a contemporary deposit.

Taxa	Iron Age Ditch (Primary fill) hand-coll.	Iron Age Ditch (Primary fill) sample	Westward House
pig	161	7	6
cattle	20	0	2
sheep/goat	40	0	13
red deer	3	0	0
hare	1	7	0
domestic fowl	4	4	0
flatfish	0	2	0
fish	0	1	0
cow-size	31	0	13
sheep-size	136	2	53
bird	2	3	0
unidentified	351	263	292
Total	749	289	379

Table 33; NISP of taxa from the different Iron Age assemblages.

Whilst the samples sizes for both assemblages (see Table 33) are too small to undertake the kind of traditional economic analyses presented in chapter 3, when considered in detail at a micro level, in social terms and using evidence from other contemporary sites, it is possible to gain information relating to Iron Age human-animal-landscape relationships. To achieve this I will start by briefly describing the character of the assemblages in terms of species representation before moving onto their interpretation, which will draw upon skeletal representation and ageing data as well as evidence from other contemporary sites and discussion from social anthropology.

Interestingly, the ditch assemblage includes a number of wild animals – red deer, hare, and fish – as well as a few specimens of domestic fowl. Again these animals are generally rare in Iron Age assemblages (see Chapter 6 but also Dobney and Ervynck 2007; Hambleton 2008). Unusually for Iron Age assemblages, pig remains are well represented from the ditch. This is a rare phenomenon for the Iron Age where pig remains tend to be found in quantity only on settlements of high-status, generally oppida, such as Silchester in Hampshire or Skeleton Green in Hertfordshire, sites which have been associated with late Iron Age aristocracies and long-distance trade (*cf.* Hambleton 1999; Creighton 2001, 11-21; Grant 2002). Commonly, very young animals are rare on sites of this type (see Chapter 5), which raises the probability that pigs were supplied to high-status sites of the late Iron Age as part of the trade and exchange mechanisms which were in place.

4.2.1 Production

Immature animals seem to be a feature of the Iron Age ditch assemblage. Two sheep/goat mandibles gave ages of 2-3 years, whereas epiphyseal fusion suggested that the majority of the remains were juvenile, infant or foetal. Sykes' *et al.* (Sykes *ibid.* 81) analysis of the dental ageing from pigs suggests that *c.*79% were between 21-28 months with the remaining sample ageing between 7-14 months. Epiphyseal fusion suggests that the majority of the pigs were slaughtered up to the first year with both neonatal and infant remains being identified.

SPECIMEN NO.	TAXA	CONTEXT	DATE	DENTAL DEVELOPMENT SCORE									EST. AGE (MTHS)
				dp2	dp3	dp4	pm2	pm3	pm4	M1	M2	M3	
10834	Pig	IA DITCH	10BC-AD25	0	0	0	0	0	0	8	6	0	12-13
10828	Pig	IA DITCH	10BC-AD25	0	0	0	3	5	5	8	5	2	12
10846	Pig	IA DITCH	10BC-AD25	0	0	0	0	0	0	0	0	4	12-16
10844	Pig	IA DITCH	10BC-AD25	0	0	0	0	8	8	8	8	4	12-16

Table 34; Results of dental development analysis of pig mandibles from the primary fills of the Iron Age ditch.

From my radiograph analysis of four pig mandibles from the ditch, the results suggest that each animal was killed around 1 year of age (Table 34). The development scores from specimen 10828 gave a very high resolution in age at 12 months. If the late spring/early summer birthing season for pigs (as detailed in Chapter 3) is accepted, this implies that the ditch deposits were laid down at this time of the year. What could be relevant is the fact that we have no evidence of permanent settlement at Fishbourne during this period. If Fishbourne was a site devoted to long-distance trade and exchange as is indicated by its artefact assemblage (Manley and Rudkin 2003), we might envisage a place which was engaged with by local people and travellers at specific times of the year. Considering that boundaries are concerned with marking out differences, mapping cultural distinction and Otherness (Tilley 1994, 17), a seasonal engagement with the site where discrepant practices are carried out suggests the site could have been perceived as a liminal space where the local and the distant overlapped. The presence of young animals at Iron Age Fishbourne does not necessarily indicate the presence of livestock breeding. In fact, the absence of older animals suggests that the young were reared elsewhere and imported to the site for specific consumption events similar to the evidence from other oppida (*cf.* Grant 2000). The decision to select the youngest animals to be killed and eaten is likely to have incited quite emotional responses from those who bred them.

4.2.2 Killing

The Iron Age assemblages produced no direct evidence for the methods or location of animal killing though such evidence is unnecessary; the fact that animals were killed is clear to see. A greater issue, I would contend, is the context of the death, in terms of whether the animals were slaughtered or sacrificed. It seems more likely that the latter was the case, given that it has been argued repeatedly that, in non-commercial societies where 'meat-retail' is lacking, most animal killing is a sacrifice (Symons 2002, Sykes forthcoming). Such as scenario is unsurprising considering that, across cultures, very strong attachments form between people and their livestock. In East African groups, for instance, Herskovits (1926, 256) highlighted the great affection for and identification with cattle, including a general dislike for killing them, except within social rituals. Such a premise is exemplified by a member of the Mkamba tribe of Kenya: "I shall never forget the horror displayed by a native who complained that he was starving, when I suggested that he should slaughter a cow; such a thing is inconceivable to the Mkamba;....neither will he think of selling a cow, even if he is on the verge of starvation" (Dundas 1913, 501). Similarly Abbink (2003, 348-349) describes the close affection the Suri, of northeast Africa, have for their cattle. Each boy is given a favourite animal who he invokes the name of in battle and ceremony. When the animal dies it is not eaten by its human counterpart (that is considered cannibalism) who instead mourns the animal.

Sacrifice in modern western society tends to be seen as something negative; having to give something up (see also Symons 2002, 442). In non-western groups, sacrifice is a cultural practice through which social relations are negotiated and maintained (Barrett *et al.* 1991, 7). For instance, despite their close attachments, the Suri will sacrifice cattle. Although a rare occurrence, it is percieved to be beneficial because it 'displaces guilt or defuses tension between groups within the community' (Abbink *ibid.* 349). It is a means of deflecting danger by keeping or restoring balance between rival groups which come into conflict.

On Iron Age sites in southern Britain it is quite possible that all killing of livestock was seen in this way: a continual sacrifice of animals tied into social exchanges and the importance of the land. If all killing was seen as a sacrifice in Iron Age Britain then this may have been the fundamental reason to kill the animal, not to eat it. Consumption was simply a by-product, albeit an important one as it continued the process being carried out.

The large number of calves at Danebury, Hampshire, represents the rapid destruction of wealth, the potential of which had not yet been reached (Grant 1984). For people involved in the breeding, raising and herding of cattle such slaughter would have signified the importance of the people carrying out the act. The social anthropologists Farb and Armelagos (1980, 125-126) argue that meat is favoured for sacrifice because people know they cannot afford to kill their livestock, though they know that their loss will be overcome through the benefits obtained from the supernatural. The presence of juveniles in the ditch at Fishbourne can be seen in a similar context. As noted, the artefactual evidence suggests that long-distance contacts were being maintained. Considering pigs are rare on Iron Age settlements compared to cattle and sheep, their social value was presumably much higher. The sacrifice of young pigs therefore represents an event of only the highest social value. For the people who bred and reared pigs in the area they would have been giving up companions in order to dissolve social boundaries.

For pastoral societies the killing of a single animal has tremendous social significance and can fulfil highly important cultural obligations. At religious sites such as Uley, Gloucestershire (Levitan 1993), and Hayling Island, Hampshire (King 2005), the killing of groups of goats, sheep and pigs (at the latter) in very large numbers on a seasonal basis would have been an intensified experience compared to the death of single or small number of livestock at any given time. Levitan (1993, 300) has argued that as many as 150 goats were sacrificed each year in order to produce the assemblage excavated from Uley. This places an emotional emphasis on the religious context of the sites, generating a very vivid idea of space. However these sites represent the beginnings of a social practice which, although it originated in the late Iron Age, developed further in the Roman period: the geographic separation of the sacred and the profane (Hill 1995, 122-123). The sacrifice of the animal and the attachments between the human and the animal must also be *felt* in the way that the animal was dismembered after being killed.

4.2.3 Butchery and Carcass Processing

The body part patterns for the Iron Age ditch assemblage indicated high frequencies of head bones and foot bones, although sheep/goat were also well represented by femora and tibiae (Sykes 2005, 81). A number of articulating sets of foot bones were found for cattle, red deer and hare. Pig remains included fewer foot bones but there were higher frequencies of humeri, scapulae, tibiae and, in particular, head bones, including articulating cervical vertebrae (axis and atlas). The over-representation of jaw bones is common for pig assemblages, suggesting that these patterns may be due to factors of preservation and recovery (Sykes 2005, 83). However it is noteworthy that strikingly similar patterns have been observed on other Iron Age sites in southern Britain where they have been interpreted as intentional deposits, rather than artifices of preservation. Knight (2002, 52), for instance, highlighted the careful deposition of pig skulls and foot bones at Danebury as articulated parts within internal pits. She concluded that, rather than representing primary waste, they were more likely the remains of pig heads given to members of the elite so that meat from the head and neck of the animal could be consumed. The evidence from Silchester – where pigs were also well represented by head bones (Grant 2000, 436) – may further support this suggestion.

Whilst the distribution of livestock seems to have been importantly related to specific areas of the landscape, the redistribution of animals after they have been dismembered has also been shown to be intimately linked to territory and group identity (Mooketsi 2001; Lokuruka 2006; Bussatta 2007). Heads of livestock animals are often important in pastoral societies, seen to embody the whole animal and often are the designated portion given to group leaders (Lokuruka 2006, 208). Symons (2002, 442) argues that the underlying meaning to the butchery of an animal is the distribution of the meat. In this context the animal is not lost, but allocated. Accordingly, sacrifice should be observed as the elaborate slaughter and distribution of a carcass. The body part evidence from Iron Age sites indicates that the kill and butchery of the animal took place together at the site. This would suggest that the people who gathered for these occasions experienced the whole process. If these gatherings involved people from different social groups in different places in the region then the distribution of meat at gatherings could serve to reinforce those differences and reflect alliances between villages from different areas. Similar evidence has been seen in ethnographic accounts such as the Nootkan tribe of Vancouver Island, as Bussatta (2007, 5) notes from a whale feast: 'Our people didn't just go down the beach and cut off a piece of meat off. There was a certain cut for each chief...When the whale was cut, it represented every inch of our chief's territory, every cut had to be precise.'

Evidence of butchery was minimal for all the Fishbourne Iron Age material. Only 7 specimens from the ditch bore marks. A sheep/goat pelvis and rib had single knife marks as did the distal end of an almost complete pig humerus. The distal shaft of a second pig humerus had been chopped through, whilst a proximal humerus from a pig had been chopped across the proximal articulation severing the bone from the scapula. Corresponding chop marks were evident on the articulation of a pig scapula. These three specimens may represent a single processed joint. Certainly the proximal humerus and the scapula were excavated from the same context (913).

This type of butchery conforms to previous studies from Iron Age settlements in southern Britain where a lack standardised butchery marking is common, and assemblages are often characterised by knife-marks as opposed to chopping (Grant 1987, Maltby 2007). Certainly this was the case at Selhurst Park, West Sussex, where the majority of the front half of a cow had been buried in the pit context with the skull and neck, with cut mark evidence suggesting that different parts of the body had been carefully dissected and buried separately (Allen 2010). Evidence from cut marks on the Iron Age pig material from Silchester indicates that very careful dismemberment of carcases took place with knives around the main joints, with minimal indications of the use of cleavers or other heavier tools which might be expected in large-scale redistribution of meat (Grant 2000, 444). Pig long bones from Danebury were rarely found to be longitudinally split for marrow processing suggesting a lack of intensive processing (Knight 2002). Placement of cut marks on pig skull and mandible fragments at Danebury suggest the careful removal of flesh from the body prior to disposal of the head (Knight 2002, 53; Figure 114).

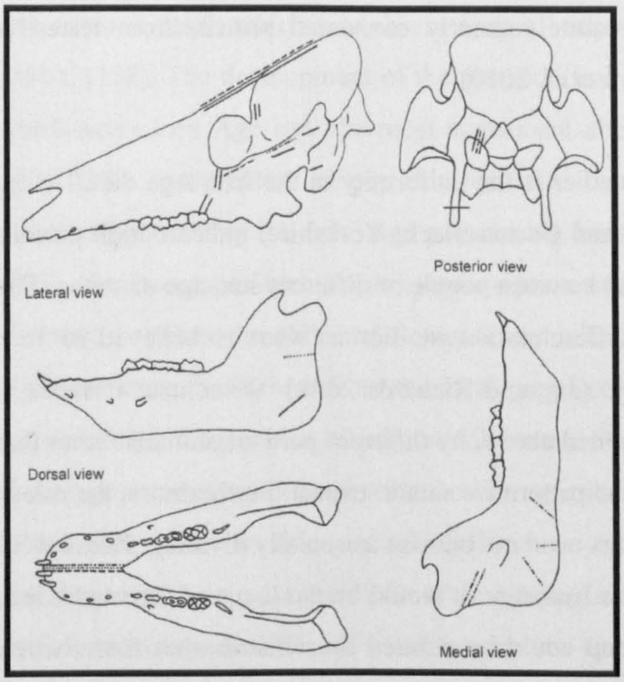


Figure 114; Placement of cut marks on pig skulls and mandible specimens at Danebury (after Knight 2002, 53, fig.3).

Butchery, as defined by Seetah (2008, 137) is 'the range of processes, employing implements by which humans are able to disarticulate a carcass into units depending on ultimate use'. However, this definition emphasises only the practicalities of butchery; the performance of butchery provides a window into the relationship between people and their animals (Sykes in prep.). The evidence from Iron Age carcass processing patterns seen at Fishbourne and other Iron Age settlements resonates with the customs of the Yali people of West Papua, whose butchery practices have been observed to entail a delicate process of using traditional tools to dismember the carcass (Studer and Pillonel 2007, 323-324). This method of processing and redistributing of the animal reflects the close social bonds between the Yali and their pigs – it would not be deemed appropriate to chop their animals into standardised cuts of meat, the butchery is a highly intimate experience between two individuals. I would argue that a similar situation may have existed in Iron Age Britain and, if my suggestion is accepted, it stands to reason that the consumption of animals would have been an equally emotive act.

4.2.4 Consumption

In some non-western societies there are clear segregations between elite meat-eaters and vegetarians who herd livestock but never engage in consuming those animals which are instead sacred (Robbins 1998, 224). However, isotopic analysis of Iron Age diets from several areas of the country has indicated that this was never the case for Iron Age Britain;

results consistently show that people quite regularly consumed protein from terrestrial animals (Jay and Richards 2008; Redfern *et al.* 2010).

What is apparent from many of these studies is the uniformity in the Iron Age diet. Isotope analysis of human burials at Wetwang and Garton Slack, Yorkshire, indicate high protein-based diets which were not differentiated between people of different sex, age or status. This surprised the authors who expected differentiation in diet in what is believed to be a 'complex and socially-stratified society' (Jay and Richards 2008). Of course, if status or social groups were defined, as I have argued above, by different parts of animals rather than different quantities of meat then this is the pattern we should expect. Furthermore, the role of distribution and consumption at gatherings need not be seen as socially dividing. Pastoral life was clearly central to everyday life in the Iron Age: it would be the focus of the worldviews of communities. The place of each group could be defined by redistribution feasts where each are coming together to recognise their respective goals (*cf.* Hayden 1996, 129). As Symons (2002, 442) points out, 'sacrifice' should be viewed in more terms of community solidarity than social differentiation. It is as much about dissolving social boundaries as it is about maintaining them. On an emotional level, the death of the animal is seen in many communities as a method of displacing negative relationships between groups or individuals because of the guilt felt at the killing of the animal (Abbink 2003, 349).

Isotope analyses cannot distinguish between animal proteins from flesh and secondary products, and so we are currently unable to remark on the regularity with which meat was consumed. The production and consumption of milk was also likely to have been commonly practised, indicating that the high protein diets of Iron Age populations need not be due to the consumption of meat. The evidence from the production and distribution of domestic animals in the Iron Age suggests, to me, that the killing and eating of livestock was restricted and regulated (wider evidence for this will be presented in Chapter 5). The seasonality data from sheep/goat tooth development at Fishbourne presented in Chapter 3 suggests that the earliest phases included a more restricted range in caprine culling compared to later phases.

The consumption of meat is entirely bound to cultural worldviews and in the context of the Iron Age there seems not to have been a distinct separation between the sacred and the profane, other than the very late religious sites which continued into the Roman period (see Chapter 4.2.2). However, evidence that dietary patterns began to diversify in the late pre-Roman Iron Age has long been suspected (Creighton 2000, 214-215). Isotopic analysis from the Iron Age rural cemetery near Dorchester, Dorset, indicates that some people had begun to differentiate themselves from the general population by including some aquatic protein resources, a result which was absent from all other burials in the local area (Redfern *et al.* 2010, 1158). The development of the new political elite in the oppida settlements of the late pre-Roman Iron Age saw the most significant alterations to the common 'Iron Age diet'. Whilst the consumption of pig was restricted to developing and maintaining inter-group relationships during the Iron Age presumably because of its high social value (Hill 1995, 103), the increased level of pork consumption could be seen in terms of increased social distance between the elite and domesticated animals, and who were now concerned with differentiating themselves from the local populace rather than consolidating different social groups. High frequencies of pigs at Silchester, Skeleton Green and Fishbourne in the late Iron Age could be associated with sacrificing animals of high value because they were more concerned with wealth and long-distance trade networks (*cf.* Grant 2002, 18). Fundamentally, animals were part of an altering mode of feasting from redistribution feasts, which consolidated different social groups, to diacritical feasts, which aim to exemplify a select elite group by excluding the lower classes (Hayden 1996, 129). This seems to suggest that worldviews – the perceptions of animals and landscapes – were, for some, shifting. Rather than observing the importance of domestic values, pastoralism and the well-being of herds of cattle and sheep, the geographical perceptions of the elite were beginning to *look* to longer distances, into 'other worlds'. Only the sacrifice of the most valuable animals was appropriate in these negotiations.

The ditch assemblage from Iron Age Fishbourne seems, almost overwhelmingly, to represent remains linked to consumption. This is reinforced by associated quantities of imported pottery most notably Arretine platters and drinking cups such as butt beakers: all high-status dining wares (Manley and Rudkin 2005, 93). Lyne's (2005) analysis of the variety of wares found in the primary silts has shown that the ditch fill was deposited quickly with the context probably open for only a short period.

> 'The assemblage is largely made up of fresh sherds from at least fifty vessels and includes a number of joining pieces. Some of the Arretine sherds appear to be more worn but this is almost certainly due to the softness of their fabrics and to soil conditions: the sherds from other Arretine vessels…are, in contrast, very fresh and include joining fragments.' (Lyne *ibid.* 67)

The primary silts at the bottom of the ditch were spread along the length of the southern side of the ditch nearest the main area of the settlement suggesting that they had been deposited from the inside of the settlement (Figure 117). Taken together with the species representation and body parts, the ditch assemblage is strongly indicative of a feasting context – an interpretation which has been reached previously for this assemblage (Sykes 2005, 84). Feasts involve a number of things, normally a number of people sometimes from different places, food which is beyond the 'everyday', and narrative or story-telling (*cf.* Dietler and Hayden 2001). The presence of the 'foreign' is represented in many ways within the Iron Age ditch. The imported pottery, Gallo-Belgic and Arretine wares, are set alongside pork and chicken. Whilst these animals may have been bred and killed in the local area, the high frequency of pig bones and the presence of domestic fowl is more reminiscent of a contemporary 'Gallic' or 'Germanic' diet (King 1984; 1999b). Continental links are also suggested by the sword scabbard from a Roman *gladius* – a military sword – which was also recovered from the clay capping (Manley and Rudkin 2005, 77). Such a find is unknown from Britain from an Iron Age context, with this particular style finding contemporaries only in Germany (*ibid.*). It would seem to reinforce the elite nature of the assemblage, particularly given the acquisition of goods from the 'outside'. Within many non-western societies, geographical distances are frequently linked to the supernatural and the ability to utilise exotica is frequently used to communicate power, even embodying a supernatural aura (see Helms 1993, 153-7).

In many cases, hunting is also viewed in this way, the hunter possessing the ability to cross boundaries, from the domestic to the wild, and return with goods from the outside (Helms 1993; Hamilakis 2003; Sykes 2010). The presence of wild animals in relatively small quantities in the ditch is perhaps just as important. There is no indication of 'over-exploitation' of the wild. As Hill (1995, 64) notes, when wild animals are recovered on Iron Age sites they are usually treated in a different manner to the majority of domesticate remains. Wild species, in general, were not seen as appropriate animals to eat. The choice of hunted species, in this case the red deer, the hare, and the flatfish, were not related to domesticated animals by their economic value so must instead have represented cultural or symbolic concerns (*cf. ibid.*). Taken together, the procuring and slaughtering of a number of pigs combined with hunting of wild mammals, albeit small-scale in relative frequency, suggests alternative approaches by the community at Fishbourne towards the local environment to the general norm.

4.2.5 Burning

One aspect which links the Iron Age ditch and the small assemblage from Westward House is that both were significantly burnt. The pit deposit from Westward House was interpreted as a cremation burial. However, no remains of human bone were recovered from this context so the interpretation currently remains open. The pit with burnt animal remains at Westward

House was positioned inside or adjacent to a timber structure, rectangular in shape, formed of clusters of stakes. Three sides of the structure are clear to see via the post-holes (Figure 115). The foundation of the fourth side of the building was either cut through by a later aqueduct or it simply existed as a three-sided structure. The deposition of burnt animal parts around similar structures is relatively common from late Iron Age Britain, such as at Heathrow (Grimes and Close-Brooks 1993) and Cadbury Castle (Downes 1997). Comparison to these analogies suggests that the timber structure may have been a shrine. The development of a shrine as a place of separate ritual activity at the settlement is now a generally accepted phenomenon of the late pre-Roman Iron Age (Hill 1995, 121-124; Downes 1997, 145-146; Woodward 1992).

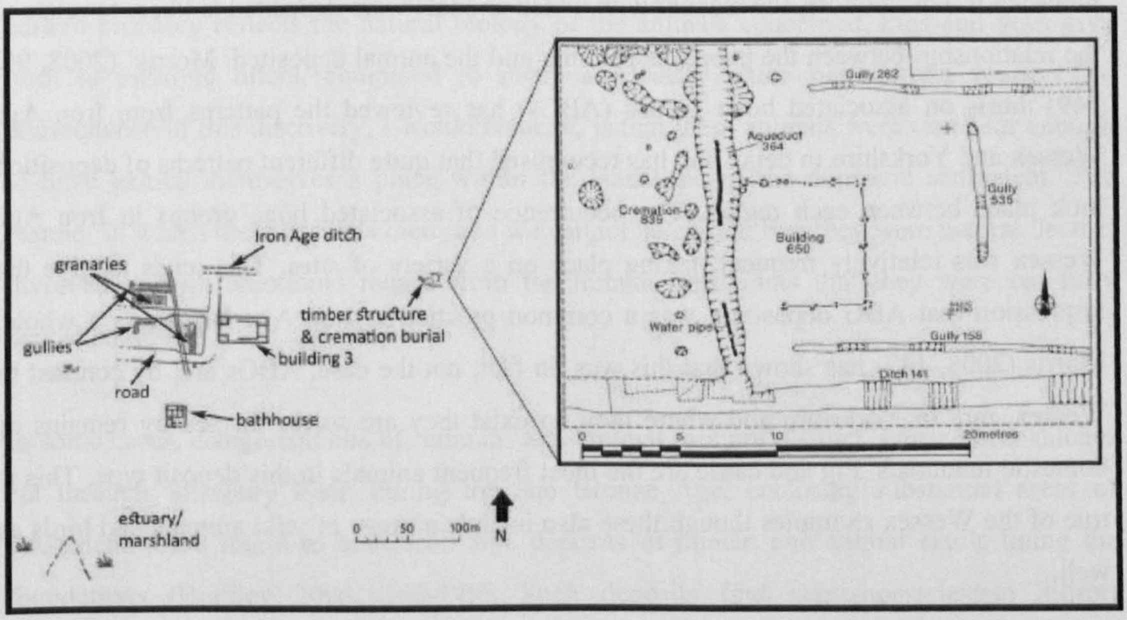


Figure 115; Location of features at Westward House (FB92) showing post-holes of early timber structure (Building 650) and associated pits (i.e. 'Cremation 835'). Note, aqueduct 364 and ditch 141 are later features (after Kenny 1992, 33).

The vast majority of the specimens from the Iron Age ditch, c.95% from the primary silts, were burnt and were found to have been heated to around 200^{o}C. This was an attribute which led Sykes (*ibid.* 80-81) to argue, from ethnographic evidence, that the burning was not representative of cooking practices but was a method of waste disposal. Bachelard (1968, 16) has suggested that the inclination to set fire to something reflects a desire to change it, not to destroy it but to renew it. In the most dramatic and sensory way fire speeds up time, it brings a conclusion to life, but importantly brings it to its hereafter. The burning of food remains has been seen as an act of sacrifice in ancient Greek society where the smoke has been suggested to have physically carried the remains to the deities (Ekroth 2008). The lighting of the fire would have been an important sensory experience, its sound and smell and the feel of the heat coming from the flame. The burning of animal bodies, the remains of feasts, have been recovered and examined from Mycenaean sanctuaries (Hamilakis and Konsolaki 2004). This study has highlighted the emotive properties of burning animal remains after the embodied act of consumption as a powerful method of generating and provoking memories, phenomena which are intimately tied to the final deposition of the remains permanently embossing the act into the environment.

4.2.6 Deposition

Deposition is the 'final' act and a fundamental part of the production, supply, distribution, and consumption process: the choice of deposition location being linked to the stages which preceded it. Furthermore, the manner with which animals were deposited is likely to relate to the relationship between the people depositing and the animal deposited. Morris' (2008, 99-149) thesis on associated bone groups (ABGs) has reviewed the patterns from Iron Age Wessex and Yorkshire in detail and has recognised that quite different patterns of deposition took place between each region. The occurrence of associated bone groups in Iron Age Wessex was relatively frequent; taking place on a variety of sites. This tends to give the impression that ABG deposition was a common practice in Iron Age Britain as a whole. Morris (2008, 142) has shown that this was, in fact, not the case. ABGs are, by contrast to Wessex, rare in Yorkshire and where they do exist they are solely formed by remains of domestic mammals. Pig and cattle are the most frequent animals in this deposit type. This is true of the Wessex examples though these also include a range of wild animals and birds as well.

Deposition of ABGs was a common act on Iron Age hillforts with Danebury, Hampshire, providing the most publicised examples with a range of different animals, from cattle and sheep to crows and ravens, being interred on the site (Grant 1984, 110-115). Hill's (1995, 84-94) work on the Wessex data has indicated that some spatial patterns exist in the deposition of ABGs on several sites, particularly at Winnall Down and Easton Lane, both in Hampshire. During the early phases of these settlements, animal skulls and long bones were deposited around the peripheries, whereas the later periods saw an increasing quantity of interments in the interior spaces of the sites. Morris (2008, 141-147) also recognised from the Yorkshire data that funerary sites differed from settlement sites in ABG composition at least by the middle Iron Age. This might suggest that the wider use of space between 'secular' and 'religious' had begun to fracture earlier in the Iron Age than Hill (1995, 123-124) had imagined for the later period. The open settlement at Wetwang Slack, Yorkshire, includes the deposition of complete cattle, sheep and dog ABGs inside or close to roundhouses, which suggests the very close relationship people had with these animals (Brewster 1980).

Morris (2008, 121) highlighted, from the Wessex data, that 'a noticeable difference between the complete pig and complete cattle and sheep/goat ABGs is that the pig deposits are often found in groups.' For example, at Danebury, Houghton Down and Nettlebank Copse, groups of neonatal complete pig ABGs were discovered in the same context, whereas the cattle and sheep/goat ABGs were found isolated. In these instances, human conduct has varied towards pigs compared to that shown towards cattle, sheep and goats. Many of these pig burials are similar to dog burials where a greater number of individuals are interred together. Morris (2008, 120-124) recognised that many of these deposits included neonatal animals so the pattern probably reflects the natural biology of the animals concerned. Pigs and dogs give birth to multiple litters, compared to sheep and cattle which birth single young. The consequence of this discovery, I would contend, is that these animals were cared for enough to have gained themselves a place within the landscape of the domestic settlement. The manner in which these animals died (and we cannot be certain that they were natural deaths) involved enough emotional regard from the human inhabitants that they were carefully deposited on site.

In some cases, categorisations of 'human' and 'animal' are not distinct. Large linear ditches cut through Salisbury Plain during the late Bronze Age, enclosing substantial areas of settlement, were found to have Iron Age deposits of human and animal skulls lining the foundations (Bradley 2000, 148-149). Such deposits find contemporaries in hillfort embankments and so these seem to be marking boundary lines. It is apparent that some of these contexts were left open when deposited as some are covered by later erosion of the bank (Figure 116). They are also likely to have been quite common. Bradley *et al.*'s (1994, 42, 46) excavations only consisted 30 narrow sections through ditches which extended over many kilometres. If you were to walk along these boundaries during the Iron Age you may have passed the skull of a human, cow or horse (possibly others) *looking back at you* every so often. Bradley (1990; 2000, 150) has noted that carbon dating of these remains suggest they were present throughout the Iron Age and that the deposits were particularly prominent when the phenomenon of metalwork in watery contexts was coming to a minimum. Hill (1995, 108-111) has argued that deposits of this type, when found on domestic settlements were tied to the agricultural cycle and the fertility of human and animal populations. Bradley (2000, 150-151) suggests that Iron Age deposits of human/animal skulls in the linear ditches represent a dispersing of human (and possibly animal) identities along the boundaries. If so, I would argue that this gives the skulls a totemic quality. Those identities are not *dead* as such but their lives are entwined with the land, as Ingold (2000, 112) puts it, 'congealed in perpetuity in the features, textures and contours of the land.' Here people and animals were literally a part of the landscape for all to see. It also indicates that the relationship between humans and animals were not simply close, but embroidered together.

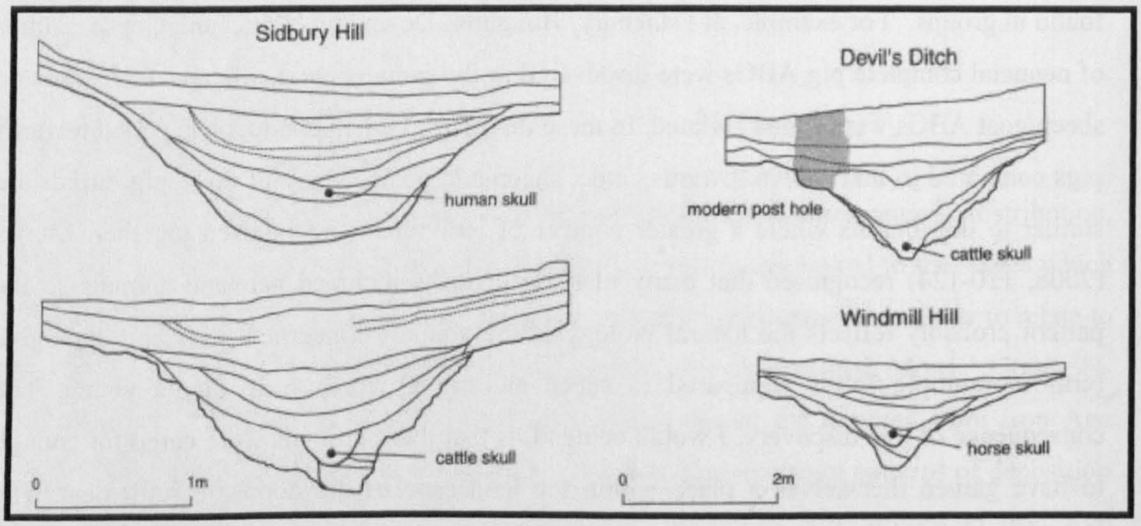


Figure 116; Deposits of human and animal skulls in Iron Age linear ditches on Salisbury Plain (after Bradley 2000, 149).

If Hill (1995, 102-114) and others (e.g. Barrett *et al.* 1991, 7) have been forthcoming in stressing that 'ritual' was simply a form of emphasising and memorialising everyday life, burials representing the 'unusual' are more difficult to explain. Some animal deposits are found at many mid/late Iron Age sites in Hampshire where there seems to have been a concern with memorialising odd or rare animals. Cattle skulls of 'unusual conformation' have been excavated at Nettlebank Copse and Suddern Farm; Houghton Down produced the very early examples of chicken with the purposeful 'cock and hen' deposits (Hamilton 2000, 81); and Suddern Farm also contained ram skulls with exceptionally large horns (Cunliffe 2000, 71). Iron Age society was similarly intrigued with the 'unusual' as it was concerned with forging its 'luck' with the rhythms of daily life. Yet, these were still incorporated into the fabric of the domestic dwelling. The 'everyday' and the 'exceptional' were incorporated together.

In southern Britain the separation between sites of a secular or religious nature seems to have formed during the late Iron Age (Hill 1995, 123-124; Creighton 2000, 188-197). Notable of these, as mention earlier, are the shrines at Uley Bury hillfort (Woodward and Leach 1993) and the shrine on Hayling Island (King and Soffe 1994). The former was characterised by a goat-dominated assemblage and the latter by a sheep/goat and pig-dominated assemblage. Pigs in particular are commonly associated with elite groups in Iron Age Britain and Gaul, importantly, in the ways they were deposited with people. The Iron Age cemetery at Tartingy consisted of five graves with high-status individuals which included a predominance of pig remains accompanying the burials (Green 1992, 107-108). The remains recovered here suggest evidence for food preparation and feasting. Pig skulls were often found split to extract the brain and tongue with other body parts being systematically deposited within different burials (*ibid.*). These examples sit well with the evidence for pig processing at Hayling Island where specific body parts were distributed and deposited in particular spaces in the site (King 2005, 340).

The separation of religious sites from the domestic world in the late Iron Age is generally thought to have been a new phenomenon (Hill *ibid.*). I would argue, however, that the movement towards liminal spaces at the edges of territories was simply a development of longer historical trajectories and practices. The evidence presented so far has consistently shown that animals (and people) were being buried in places in domestic settlements, at the peripheries of those settlements, and at the peripheries of wider territories, presumably at the boundaries between *worlds*. In the middle Iron Age, people were travelling to the boundaries of their land and memorialising landscape features with the bodies of people and animals as an expression, it would seem, of individual or group identity. This carried on into the late Iron Age. Many of the places which became 'religious' sites were hillforts – Uley Bury, Maiden Castle, etc. – sites which had previously been central places. The development of the pre-Roman elite in the oppida of low-lying areas shifted the focus of settlement. Consequently the 'old settlements' were now peripheral places, liminal both in time and space, where the old tradition of periodically moving towards with great quantities of animals which were killed, distributed and deposited in a *grand* manner continued. The implications for Hayling Island are interesting as nothing is known about the island prior to the shrine there. The evidence for deposition of animal remains in Iron Age southern Britain is extensive in quantity and variety. Whilst the Iron Age deposits at Fishbourne generally indicate practices which were different to the norm, they simply encompass long held traditions which were customary to southern Britain being appropriate to the time, space and context.

Being the primary fill of the ditch, it is also reasonable to suggest that the ditch was dug in anticipation of the burial of this material. The digging of pits and ditches has been suggested elsewhere to be a ritualised activity in the Iron Age (Cunliffe and Poole 1991, 162). The effort involved in digging a large ditch is considerable. Hill (1995, 111) has further argued that the acts of digging and depositing material in ditches physically and cosmologically associates the people, animals and artefacts concerned with *that* place in the landscape. If the full process from digging the ditch to the final infilling took place over such a short time then it is also reasonable to suggest that the entire act was planned, and carried out by the same people: a communal act. A further 'ceremonial' aspect to the Fishbourne ditch comes from the clay capping which seems to have been laid down on top of the primary deposit shortly after the burnt layer was deposited. It was within this layer that the Roman *gladius* scabbard was excavated.

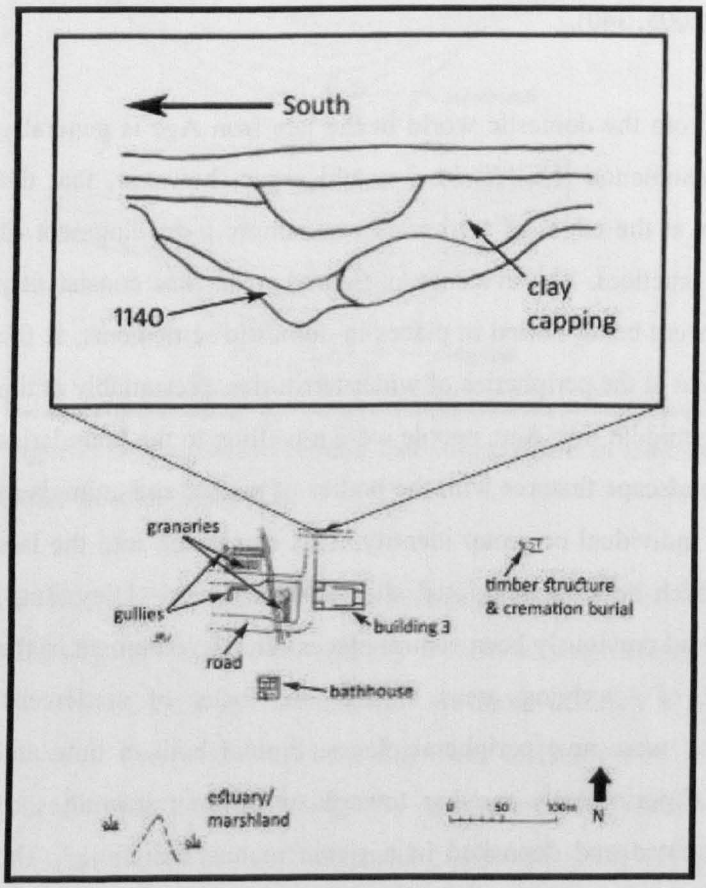


Figure 117; Location of Iron Age ditch with a section plan illustrating the position of the primary fills along the southern side of the ditch bottom (given here as context 1140). This is butted by later slumping from the north side of the ditch and overlain by a clay capping (section drawing modified after Manley and Rudkin 2005, 62).

After the burning of the remains they were seemingly gathered and placed quite deliberately and carefully along the south side of the ditch (Figure 117). They were certainly not thrown haphazardly into the feature as might be expected of a normal waste deposit. Commonly, the burial of food remains is seen in archaeological circles as a method of disposing them, of removing them from the world. And yet we have an abundance of evidence for the Iron Age tradition of interring artefacts in landscape features as a method of creating memories (Fitzpatrick 1984; Willis 2007, 115). The visibility of boundaries was an increasingly important aspect of the Iron Age where mobility was steadily altering in a progressively bounded landscape (Gosden 1997, 305). The interring of these remains in the ground, physically etched them into the landscape, memorialising the space. The fact that the sword scabbard, an artefact highly distinctive and indicative of an individual's status at the time, was incorporated into the ditch places further emphasis on the symbolic nature of the feature and the variety of phenomena involved in creating it: the people, the animals, the time, the cost and the effort.

4.2.7 Summary Discussion of Iron Age landscapes of Dwelling

The deposits discussed here, though small, and when placed against the evidence from Iron Age Britain, provide some interesting information regarding the use of landscape by the early inhabitants at Fishbourne. These suggest events of considerable social meaning though seemingly commemorative of very different acts. The Iron Age ditch looks to be boundary-defining in many senses. The feature provides something of a paradox in this sense however. To the modern-mind a ditch represents a boundary, though this was a feature which holds metaphorical hallmarks of travel, traversing and boundary crossing. The inclusion of wild mammals seems to have been important here. Wild mammals and fish are found in the Iron Age ditch, whereas wild animals were absent altogether from the Westward House area, though we cannot underestimate the consequence of the small sample size in the latter.

A range of powerful sensory attributes were incorporated into the construction of landscape features; ones where animals were at the heart, through hunting, eating, burning, and burial. These incite a series of psychological notions including travel, sacrifice, and regeneration. The separation of this ditch from everyday rhythms, as a collective of a range of symbolic acts opposed to a mundane 'hole for food waste'. Unfortunately, as noted, the ditch is the only deposit at the site which is securely dated to this period. If it does represent a break from the normal patterns of daily being, it suggests that highly ritualised procedures were taking place in the very earliest periods of life at Fishbourne. If such deposits brought people, animals and artefacts together in marking a transformation of some type, be it seasonal or of the human body for example (birth, coming of age, death) as argued by Hill (1995, 113), then by association it was also a transformation of landscape. The deposition of material on prehistoric sites has been shown to indicate the accumulation of long-term histories (*ibid.*), the ditch deposit at Fishbourne, whilst a continuation of cultural practice, also represents something different, something new. The immediate landscape of the site was being *made*.

4.3 Roman deposits

4.3.1 c.AD41-50

Two contexts of very early Roman date of AD41-50 can be separated from general pre-Palace deposits which date between AD43-75. These were a sealed gully (178/10) associated with the northern-most granary and a post-pit (4/A) for the granary itself (Figure 118). Both contexts were dated by Claudian pottery. Despite being in close proximity, the faunal remains from these contexts are very different in size and composition (Table 35). As with the Iron Age deposits a traditional analysis of these remains would reveal very little, however closer attention reveals the extent of the practices being carried out. The gully fill (Trench 178/10) contained a deposit rich in pig and domestic fowl but also containing red and roe deer bones in higher frequencies than cattle and sheep/goat. These tended to be meat-bearing body parts as opposed to extremities. This deposit also contained the remains of wildfowl including barnacle goose and crane, as well as smaller species in mallards, teal, and woodpigeon (Table 35). The Pit 4/A by contrast contained only 8 fragments of animal bone including horse, hare, pig and cattle. The significance of these will be discussed below.

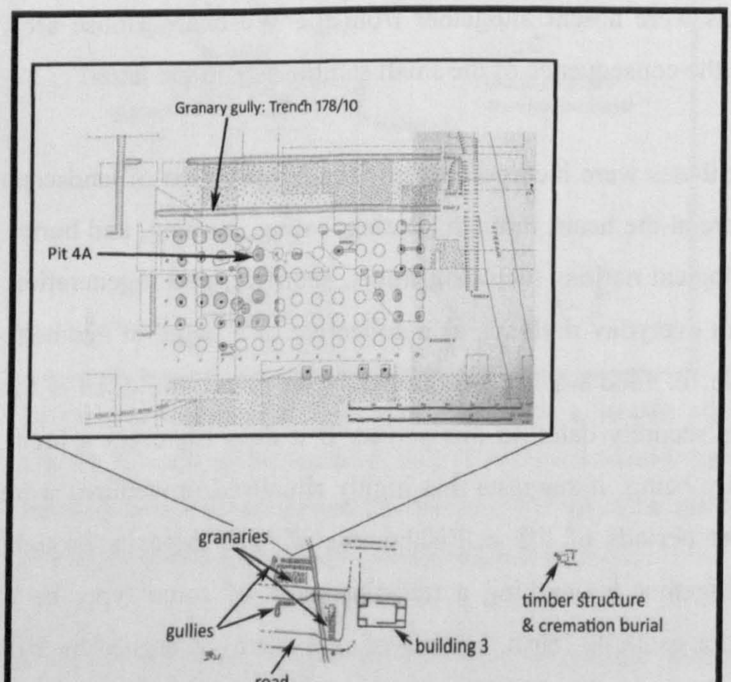


Figure 118; Location of granary post-pits and adjacent gully.

Taxa	gully (178/10)	pit (4/A)
pig	48	1
cattle	3	2
sheep/goat	5	0
horse	1	3
red deer	6	0
roe deer	7	0
hare	0	1
cow-size	26	0
sheep-size	27	1
domestic fowl	33	0
mallard	3	0
teal	1	0
barnacle goose	1	0
teal	1	0
common crane	1	0
woodpigeon	1	0
unidentified	2	0
Total	**166**	**8**

Table 35; Number of fragments by taxa from the primary fill of the gully, 178/10, and the fill of the post pit, Pit A.

The exploitation of wild resources is clearly enhanced by the first evidence for wildfowling on the site seen in the remains excavated from the gully deposit. Whilst red and roe deer are hunted through woodland, exploration into the estuarine/marshland area south of the settlement is taken up. Amongst the faunal remains, a bone whistle was also recovered (Figure 119). The artefact is extremely well made and may well have been used as a wildfowling whistle. Whistles are commonly-used instruments by wildfowlers employed for calling in a number of species (Aksakov and Windle 1998, 5, 247). Folkard's (2005, 57-66) 19th century treatise on wildfowling suggests that the whistle is an essential part of the fowler's kit used to control the decoy as well as drawing in other birds. If the Fishbourne artefact was a wildfowling whistle, as seems possible through its depositional association with wildfowl remains, it begins to illuminate the practice of wildfowling at the site. It links the people at the settlement to their immediate surroundings. The sound of the whistle call inserts the fowler into the world of the wetland and the birds which help to animate them. The remains of barnacle goose, teal and common crane are all birds which migrate to southern Britain or at least are far more numerous in the winter months. It would be reasonable to suggest that the deposit laid down in Trench 178 represented social acts carried out in that part of the year. The presence of wildfowl in late pre-Roman Iron Age deposits at Silchester (Grant 2000, 463) hint at altering ways of elite practice. Evidence of Iron Age consumption of wildfowl is currently absent from Fishbourne. However, the evidence from Fishbourne is, not only very early, but the first which seems to relate the inhabitants of the site to the act of going out to catch the wildfowl themselves before bringing them back to the site to be consumed. Again, the stages of production (better termed procurement here); distribution, consumption and disposal are moulded into the archaeological context of the faunal remains and its associated material.

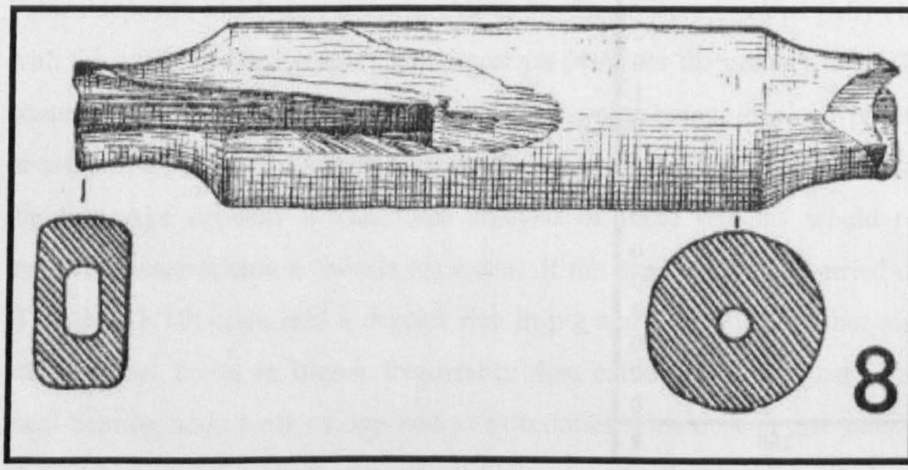


Figure 119; Bone whistle from early gully deposit (trench 178/10 – after Cunliffe 1971, 146, fig.8). A wildfowler's decoy?

Pit 4/A contrasts with the gully fill. It does not indicate the mass consumption of wildfowl, venison and pork. Instead, equid remains are represented by a metacarpal and metatarsal (Figure 120). Both of the specimens appeared to be from the right-hand side of the body. The distal ends were unfused and included some wear damage, particularly to the metatarsal, on the epiphyseal articulation. Both bones had been butchered: each had been sawn traversely through the diaphysis removing the proximal ends. These ends were not recovered. These specimens are very likely to be from the same individual; a foal which must have been under 2 years old when it died as both distal metapodials fuse at this age in equids (Getty 1975). The bone had a very lacey feel to the surface which suggests it was some way from full maturity.

Figure 120; Infant horse metatarsal (left) and metacarpal (right) from trench 4, pit A. The shafts have been sawn through towards the proximal end and the distal ends are unfused.

As seen in Chapter 3, horse remains are present in only small frequencies from the earliest phases at Fishbourne. Increasing quantities of horse remains on sites in southern Britain from the middle to late Iron Age suggested to Creighton (2000, 13-21) that this species had gained a much greater social and political importance. The nature of horse husbandry in the late Iron Age is a greatly understudied area (though see Bendrey 2010), and will be a focus of discussion again in Chapter 6. The presence of a foal indicates that horse breeding may have taken place on site. However, these are isolated specimens and may instead represent the trade or gift-exchange of a highly valued commodity.

However, the character of this deposit is quite difficult for us to comprehend. At some point a very young horse was killed or had naturally died, and its feet, front and back from the right hand side, where removed from the rest of the body. The motive for this action is unclear, but it seems likely that the removal of the feet in this way, as a transformative process, altered the meaning of the body parts (*cf.* Morris 2008, 353-354). As a very young animal only a short space of time had ensued for people to build up social relations with it. However, this does not mean the animal had not been cared for. As Bendrey (2010) explains, the examination of horse remains in similar contexts to cattle, sheep, goats and pigs may not be entirely appropriate. Many of these animals seem to have been raised in small numbers in the late Iron Age and early Roman period which suggests close human attention (see also Locker 2000, 105).

Another point to note in the biography of these remains is that the feet were very deliberately sawn through. We may ask as to why they were not dissected at the joint with a knife? The tendons and cartilage would probably have been easier to sever with a knife than it would have been to saw through the bone, yet this method was deemed more appropriate. The feet bones in the pit seem likely to have had a high social value. Being removed from the body does not make them waste; in fact the specifics of the remains, the butchery and the collection of the right-hand side, indicate that these were quite important. People may have known that these acts would be carried out before the animal had deceased. Again, whether the foal had been deliberately killed is speculative.

As mentioned, the close proximity of the two deposits in the granary area does not reflect in any way the biographies which went into the makeup of their faunal remains. There is continuity from the late Iron Age ditch with the high proportion of pig remains and the presence of wild animals. The inclusion of wildfowl suggests that these may have developed however. The recovery of a bone whistle suggests that we are seeing evidence of people actually wildfowling, the method of procuring the animals. This is especially important as it the first time that we have introduced the element of sound through archaeological evidence. The next phase provides further evidence of the soundscape of human-animal relationships at Fishbourne.

4.3.2 c.AD43-75

Animals were clearly moving around the landscape at Fishbourne. Evidence of livestock herding is usually discussed through species proportions and age patterns. The sound of livestock herding is evidenced through artefacts excavated from this phase. Three separate finds of animal bells were recovered in the area to the east of the northern granary (Figure 121). These are pre-Palace in date and, in fact, must pre-date the construction of the Proto-Palace because the original stream line remained in place when these were buried. The stream was realigned close to the construction of the Proto-Palace which Cunliffe (1971, 69) dates to around AD65 based upon surviving stratigraphic evidence. Each of the three bell types excavated at Fishbourne have also been recovered from Roman Colchester, finds which were argued by Crummy (1983, 127) to be distinctive forms of animal bells in Roman Britain. Bells A and C were both recovered in the area around timber building 7 (see Figure 121). No other artefacts or bones were recovered from these contexts, both of which were gravel flooring surrounding the small structure. There is no evidence that these formed any type of votive deposit and, instead, seem to have been lost items whose function was related to the timber building or at least the area surrounding it. Cunliffe (1971, 51) left the interpretation of this structure open having dated it by a few fragments of Neronian pottery. The loss of animal bells surrounding it suggests to me that the building may have been a barn. The main human living area at this time was probably situated to the south of the two main roads where the baths existed and the Proto-Palace was to be constructed, and therefore it seems reasonable to suggest that this northern gravelled area was associated with housing livestock.

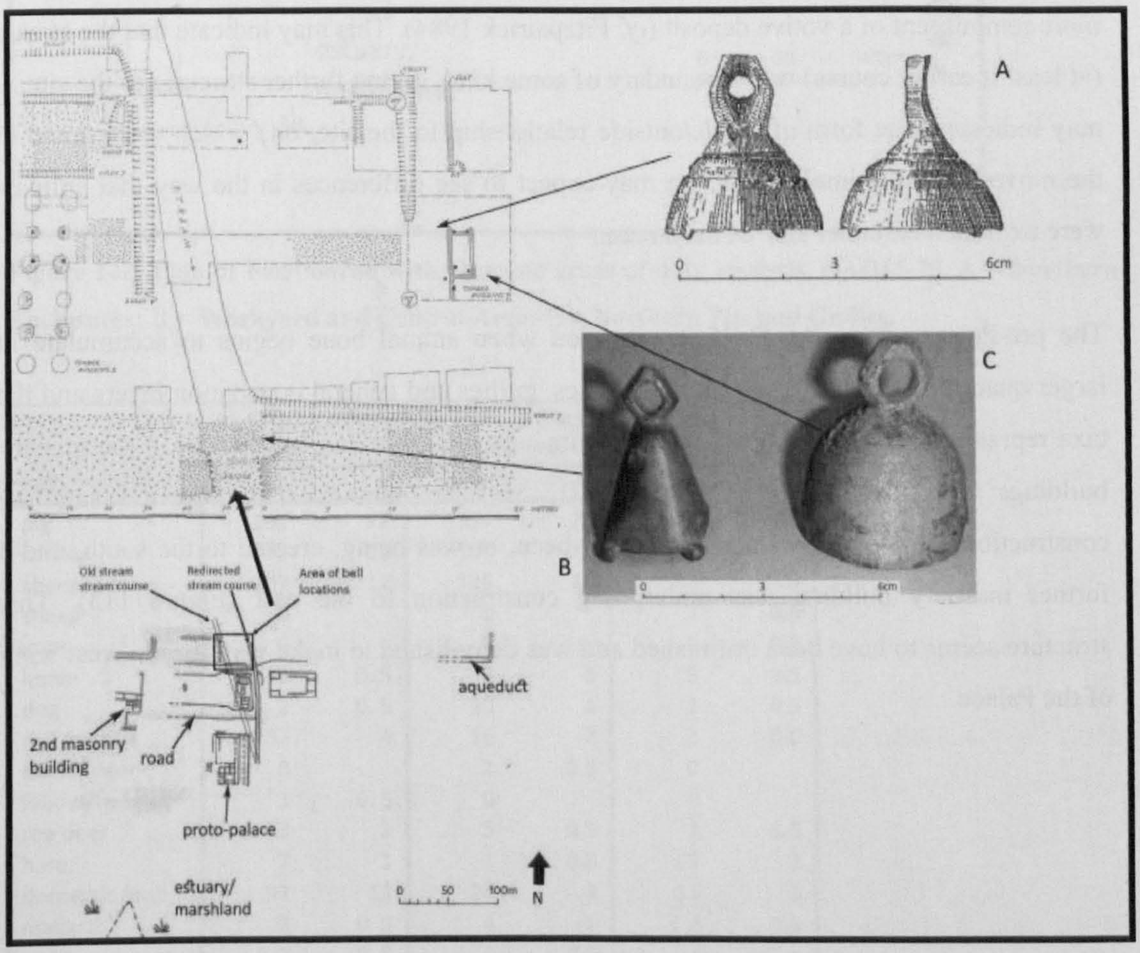


Figure 121; Location of bell finds from Fishbourne, c.AD43-65.

The use of bells on animals in this area suggests the importance of tracing them within the landscape. The animals were not kept at the site continuously but herded elsewhere in the day presumably to feed on pastures. Bells are usually given to a lead animal, but it would not be uncommon for a few of the herd to have worn bells. Considering that bells are, as far as it is known to the author, unknown prior to the Roman period, these could be the earliest find of this type in Britain. If this is the case, the sound of animals with bells would have been a whole new experience for people living within this landscape, and must have impacted on how they would have perceived the animals, the herd, creating the sound, moving from home to pasture, along new roads and back – far different to the herds of livestock who had lived for generations previously in the same place.

The location of the bell finds provides a focus for the place of herd management at the site. The sound of animal bells would have given aural animation to the settlement itself as livestock travelled into and out of the settlement. A third bell, bell B, was excavated from the bank of the stream next to the bridge which needed to be crossed when moving into the centre of the settlement. This bell is hardly worn and its location, in a watery context, is more reminiscent of a votive deposit (*cf.* Fitzpatrick 1984). This may indicate that the stream (at least it earlier course) was a boundary of some kind, giving further structure to the site. It may indicate some form of inside/outside relationship to the site, one which was related to the movement of animals. If so, we may expect to see differences in the way that animals were exploited on either side of the stream.

The pre-Palace phase, AD43-75, is a period when animal bone begins to accumulate in larger quantities across the site in pits, ditches, gullies and general occupation layers and the taxa representation is shown, by major feature/area, in Table 36. Around AD50 the granary buildings were demolished (Cunliffe 1971, 35). As mentioned, this period saw the construction of the Proto-Palace which had been, or was being, erected to the south, and a further masonry building was undergoing construction to the east (Figure 113). This structure seems to have been unfinished and was demolished to make way for the west wing of the Palace.

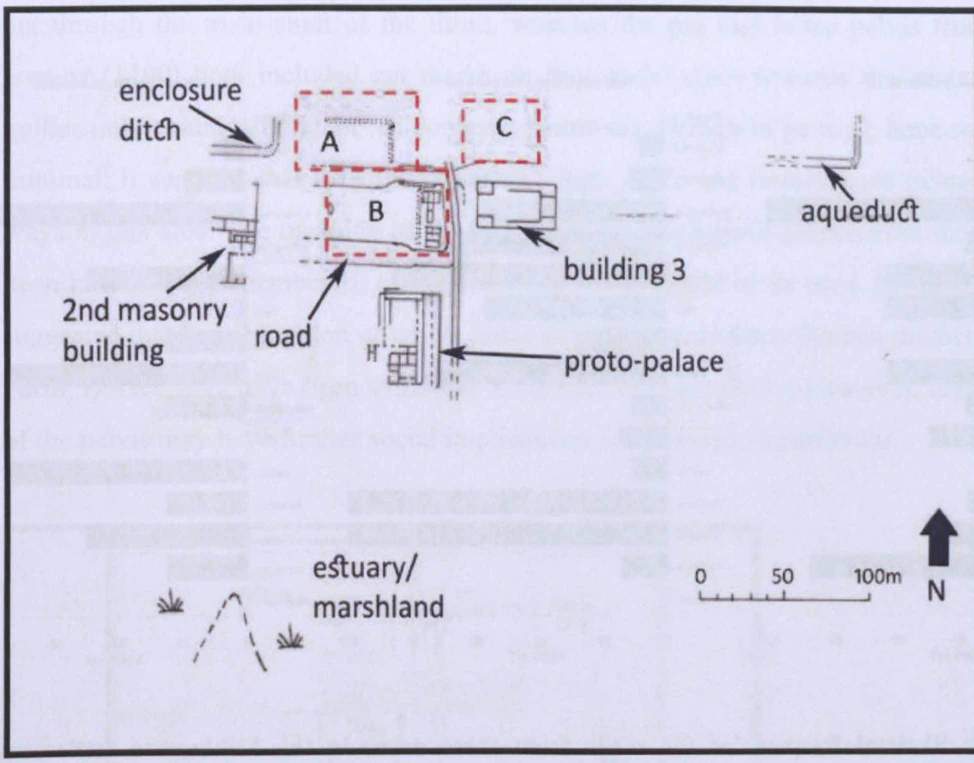


Figure 122; Plan of Fishbourne with separate areas of data analysis, *c*.AD45-75. A = Northern Enclosures; B = Workyard and Central Area; C = Northern Pits and Gullies.

	A: Northern Enclosures		B: Workyard and Central Area		C: Northern Pits and Gullies	
Taxa	NISP	%	NISP	%	NISP	%
pig	191	22	197	26	143	10
cattle	95	11	100	13	52	4
sheep/goat	107	12	126	16	82	6
sheep	0		0		3	0.5
goat	0		0		1	0.5
horse	3	0. 5	8	1	5	0.5
dog	2	0. 5	10	1	1	0.5
red deer	33	4	16	2	2	0.5
fallow deer	0		2	0.5	0	
fallow/red deer	1	0. 5	0		0	
roe deer	23	3	5	0.5	1	0.5
hare	7	1	1	0.5	25	2
domestic fowl	97	11	24	3	12	1
mallard	3	0. 5	4	1	2	0.5
goose	2	0. 5	1	0.5	3	0. 5
teal	1	0. 5	0		0	
common crane	5	0. 5	0		0	0
spoonbill	0		0		1	0. 5
woodpigeon	1	0.5	0		4	0. 5
thrush	0		0		5	0. 5
gull	0		0		10	1
bird	5	0. 5	2	0.5	2	0. 5
fish	0		0		1	0. 5
cow-size	95	11	73	10	176	13
sheep-size	195	22	157	20	291	21
unidentified	10	1	42	5	546	40
Total	876		768		1368	

Table 36; NISP of remains by area, c.AD43-75.

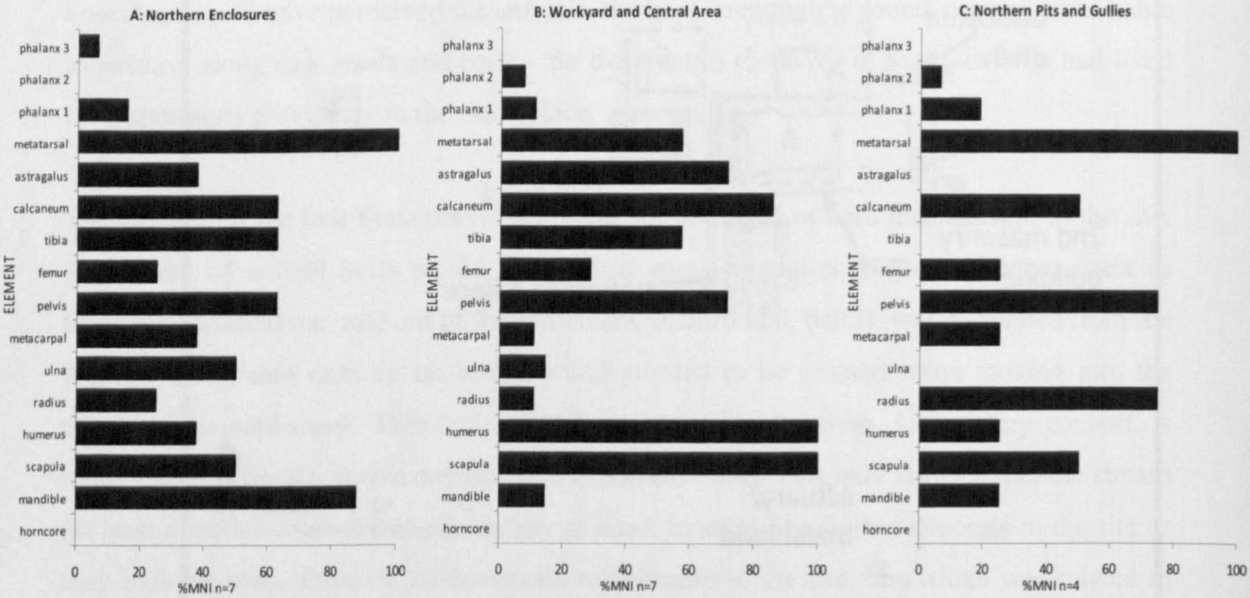


Figure 123; Skeletal frequencies for cattle from three areas in the Fishbourne settlement, cAD43-75.

The area of the Northern Enclosures shows quite different patterns in many respects (the area north of the road (Figure 122)) to the other two areas. Cattle skeletal frequencies indicate that mandible and metatarsals dominate. Mandible elements were relatively absent from both the first two areas. This may suggest that the area north of the road involved primary butchery of cattle. Other elements were present, however, in relatively high frequencies indicating evidence of further stages of bone disposal.

To the area north of Building 3 (Area C - where the Iron Age ditch had previously lain) a space filled with pits and gullies and large post-holes suggested that an area of quite intense activity had developed (Figure 124). Consideration of skeletal representations indicates that several of the deposits included bone which did not conform to any single stage of a butchery sequence (Figure 123). Two large post-holes were of note: one (1129) contained half a pig skull which, from the canine morphology, could be identified as a female; whereas another (1146) contained a fragment of a horse mandible and most of a horse humerus (distal). The latter context also included the vertebrae from an unidentified species of fish.

Deposits of pelves also seemed to be a feature of the gullies surrounding the timber building, Building 4 (Figure 124). Large fragments of pig pelves were placed in three separate gullies. An almost complete horse pelvis was interred with one of the pig pelves, and the ilium section of a cow pelvis was placed in a separate gully to the south. The cow pelvis had been cut through the main shaft of the ilium, whereas the pig and horse pelvis from the same context (1190) both included cut marks on the caudal sides towards the acetabulum. The gullies only contained remains of domestic mammals, though in general, bone remains were minimal. It suggests that these body parts of pigs, cattle and horses were treated in similar ways in this area. The meaning of the body part may well have altered after the animal had been killed and dismembered, taking on a new significance of its own. Bendrey (2006) has suggested that the deposition of whole horse pelvic bones in early Roman ditches at Myncen Farm, Dorset, may have been symbolic of fertility or masculinity. However, the distribution of the pelvis may have further social implications for this area in particular.

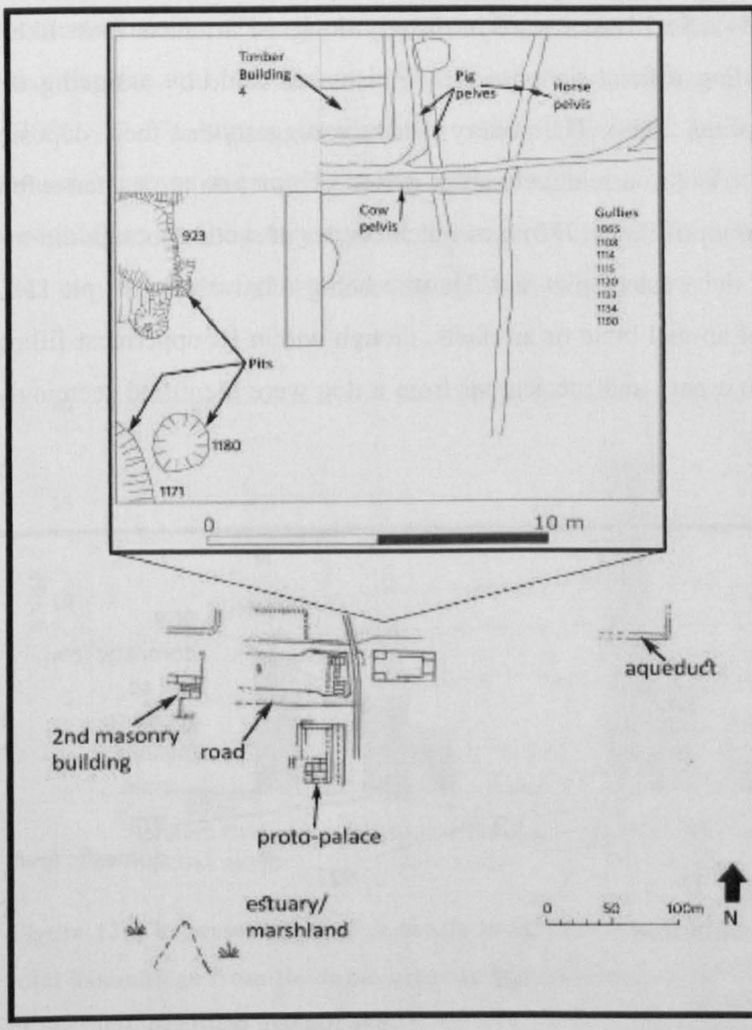


Figure 124; Location and plan of contexts north of Building 3, c.AD43-75.

To the west and southwest of the excavated area a series of pits of differing size, depth and shape were also contemporaneously in use (Figure 124 - pits). Several pits with a number of shallow deposits were excavated in the central-western part of the trench, shown in Figure 124 as context 923. Bird remains were more of a feature in these deposits. Why bird remains were absent in the nearby gullies but present in the shallow pits must relate in some way to the use of the features. One context of particular note is layer 918 in the pit (Figure 124) which included remains from a number of wetland birds such as the spoonbill, a species of gull and of goose, but also remains of thrush, woodpigeon and domestic fowl, which indicates the incorporation of birds from different environments.

These pits included the only recorded specimens of spoonbill and gull from the site during any phase. There did not seem to be any pattern to the body part representation of these species and no evidence of butchery had been observed. Another addition to deposit 918 which set it apart from others was the inclusion of imported 'exotic' stone, charcoal, quantities of pre-Flavian Arretine and Samian wares and a leaded bronze from a seal box (Manley and Rudkin 2003, 84). Seal boxes were intricately designed artefacts most likely used to conceal wax for sealing official documents or objects of value by assigning the identity of the bearer (see Collins 2008). The pottery evidence suggests that these deposits were overlain upon each other within a relatively short period of time; no more than a few years (*ibid.*). The pit to the south of 923 (1180) was much deeper in section though did not include any bird remains, as the western pits had. Despite being relatively large, pit 1180 contained minimal remains of animal bone or artefacts, though within its uppermost filling the articulated lower leg from a hare and metacarpal from a dog were identified seemingly deposited together.

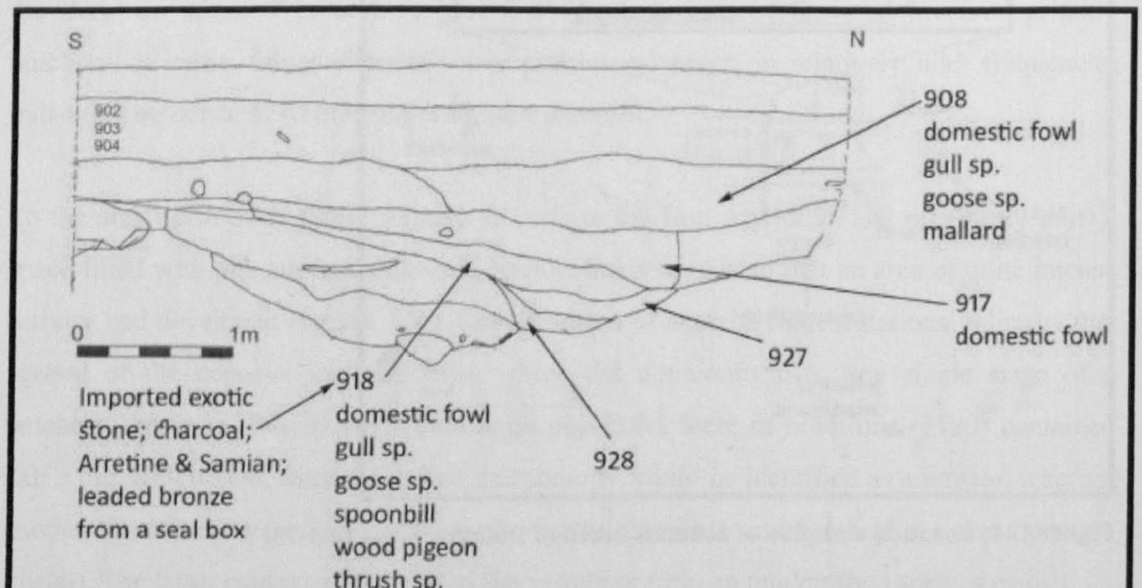


Figure 125; Section through western pits (923 on plan) with contexts dated to c.AD43-75 highlighted and position of bird remains within the feature.

Each of the feature-types in the area seem to have been quite structured with regards to the types of, or body parts of, particular animals which were in interred. The range of wildfowl in pit deposit is interesting and the incorporation of gull remains, of which there were 9 from various fragmented long bones possibly from a single individual, suggests a link to the coast. The exotic stone is a Mixon limestone which is now only available at a submerged reef of the coast of Selsey (the peninsula which juts into the English Channel about 13km south of Fishbourne). The pieces found at Fishbourne show evidence that they came from an intertidal source (Manley and Rudkin 2003, 91). The gull remains, and possibly the spoonbill, may have been intimately tied by environmental association to the act of extracting this precious material from the wider landscape. The seal box provides further contextualisation. The deposit may reflect a transaction, but one important enough to sacrifice the seal box and a small amount of the precious stone. As already noted, Gilhus (2006, 22-23) argues that animal sacrifice in the Roman World was a contractual commitment, as one might see the 'killing' and interring of the stone along with the gull and spoonbill as an obligatory right of 'giving back' to the place where they were taken. The seal box may be an artefact which assigns identity to the act.

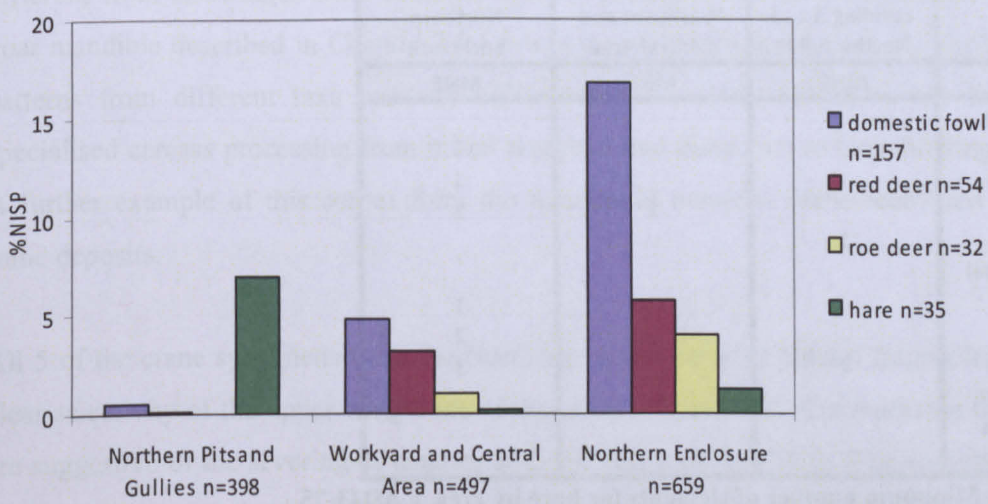


Figure 126; Representation of domestic fowl, red deer, roe deer and hare as a frequency of the total assemblage from the three areas at Fishbourne, c.AD43-75. Figures given as a percentage of the total identified assemblage.

The representation of domestic fowl and wild mammals also separated the three areas (Figure 126). Domestic fowl, red deer and roe deer were better represented in the Northern Enclosures than in the other two areas. Hare remains by contrast were relatively frequent in the Building 3 and Northern pits area. Relative frequencies of domestic fowl, red deer and roe deer were minimal in the area of the Northern Pits and Gullies. All three species were best represented in the Northern Enclosure area. Domestic fowl were considerably more frequent in the latter area compared to the other two. Hare remains, by contrast, were best represented in the Northern Pits and Gullies area compared to the other two. However, analysis of the body parts of hare indicate that only lower limb and extremities are found in the Northern Pits and Gully area whereas the Northern enclosures included more of the meat-bearing parts of the body (Table 37). Many of the hare remains from the former area were from fractured long bone fragments, which maybe a consequence of the chopping of the lower legs which would more likely fracture the thin long bones rather than leave detectable butchery marks. The skeletal frequencies of domestic fowl from the Northern Pits and Gullies suggest a prominence of wing elements which tends to conform to preservation bias where smaller quantities are recovered (Table 38). The Northern Enclosures by contrast shows a high preference for femur elements which indicates a clear selectivity. The presence of carpometacarpus elements in the Building 3 area whilst these are absent from the Northern Enclosure conforms to the general pattern of limb extremities being removed from the animal and deposited in that area. Although the sample size is small we are again seeing signs that animals that animals were being killed in this particular area and then their body parts moving elsewhere for further consumption.

Hare	Building 3 and Northern Pits	Workyard and Central Area	Northern Enclosure
Element	MNE	MNE	MNE
mandible			
scapula			1
humerus			1
radius		1	1
ulna	1		
metacarpal			
pelvis			1
femur			2
tibia	3		3
calcaneum			
astragalus			
metatarsal	2		

Table 37; Minimum number of elements for hare by area, c.AD43-75.

Domestic Fowl	Northern Pits and Gullies		Workyard and Central Area		Northern Enclosures	
Element	MNI	%MNI	MNI	%MNI	MNI	%MNI
coracoid	2	50.0	2	22.2	1	1.5
scapula	0	0.0	0	0.0	0	0.0
humerus	4	100.0	5	55.6	11	16.9
radius	0	0.0	1	11.1	0	0.0
ulna	2	50.0	1	11.1	13	20.0
carpometacarpus	2	50.0	0	0.0	0	0.0
pelvis	0	0.0	0	0.0	0	0.0
femur	1	25.0	2	22.2	65	100.0
tibiotarsus	0	0.0	9	100.0	7	10.8
tarsometatarsus	1	25.0	0	0.0	12	18.5

Table 38; Skeletal frequency of domestic fowl remains by area, c.AD43-75.

This area becomes fenced off at the road and a large gully was created around the area effectively closing it off from other places on the settlement (Cunliffe 1971, 72-73). Several trenches excavated within this enclosure during the 1960s uncovered a thick humic layer sitting between the foundation of the earlier granary, post-demolition and the construction levels of the later north wing. The frequencies of animal species recovered here is clearly different from elsewhere. Both domestic and wild animals are represented here. The wild boar mandible described in Chapter 3.5.5.3 was recovered from this deposit. The body part patterns from different taxa seem to indicate that the bone remains come from quite specialised carcass processing from initial slaughter and dissection to later filleting of meat. A further example of this comes from the remains of common crane recovered from the same deposits.

All 5 of the crane specimens from the Northern Enclosure were humeri fragments showing clear selectivity of the upper wing bone of the crane (Figure 127). Cut marks on the humeri are suggestive of the severing of tendons and defleshing (Allen 2009). The absence of other skeletal elements (other than the tarsometatarsus) suggests that the dissection of the birds may have taken place here with the rest of the body and maybe the meat portions moving elsewhere. Indeed, it is important to note that a right proximal tibiotarsus from a common crane was recovered from Area C of the Northern Pits and Gullies (Figure 122), though this dated to a later Palace phase. Pliny (*Hist. Nat.* 10.30) notes that cranes were particularly sort after as birds of the feast. In most recipes by Apicius cranes are cooked and served whole, or sometimes with the head removed: a culinary practice which was indicated by the remains of crane from Caerleon (Hamilton-Dyer 1993). The capture of common crane for the procurement of feathers is also possible. The primary and secondary flight feathers are located on the ulna and carpometacarpus and so seem to have been removed and taken elsewhere (Allen 2009).

Figure 127; Sub-sample of common crane remains from Fishbourne including 8 humeri fragments and 1 proximal tarsometatarsus. 5 of the humeri fragments belong to the Northern Enclosures area during the pre-Palace phase AD43-75.

The cutting-up of animals within the settlement would have been a way of dispersing flesh (Symons 2002, 443). Those controlling the cutting up of meat are likely to have held special status within the settlement. Symons (2002, 438) has argued that the division of food, 'by powerful reciprocity', is intricately associated with the division of labour. 'Each makes the other possible, and the exchange happens paradigmatically at meals' (*ibid.*). This clearly comes at a time when dramatic construction work was being carried out at Fishbourne: the Proto-Palace gets erected in the south and the large masonry building is under construction by around AD75. These are both more-than impressive buildings for early Roman Britain even before the main Palace comes into existence. The division of work may well have been exercised through the division of meat. The timber buildings in the Workyard area were interpreted as such by Cunliffe (1971, 48-49, 58-61). The propensity of cattle shoulders in this area suggests that specific body parts held particular value; the distribution of animals reflecting the distribution of labour. Whilst the dividing up of animals and meat is a method of social ordering it is also, through sharing, a method of social cohesion, and an essential ingredient whilst the site is changing its shape and form.

Fishbourne is clearly going through a transition during this period. The landscape was developing at a fast pace, one which would need many people to change it. The ways that animals are exploited became incorporated into the social make-up of the place. The settlement seems to have become even more structured. Selected body parts of animals become intricately bound up with the physical changes which were taking place at the site. There is a great deal of trading taking place, not only with artefacts, but for expensive building materials coming in to create the architecture of the site. There is evidence of husbandry and herding as well as hunting and fowling. The road system is highly developed. The evidence suggest that a great many people were present at the site; some living permanently, others moving through. I would suggest that the production and distribution of meat becomes highly ritualised in this phase. Meat and its distribution is clearly used in modern pastoral communities often offered or exchanged in many social transactions (Lokuruka 2006), and the apportioning of food is commonly related to social structures and hierarchy (Shuman 1981, 72). The deposition of animals at Fishbourne involved numerous rituals, no doubt reflecting the complex nature of the site. This phase did not last for long, however, and soon after AD75 the largest building ever to be erected in Britain stood on the site.

4.3.3 c.AD75-150

The construction of the main Palace building, the southern garden with its associated deep-water channel, and the production of various ancillary features such as the aqueduct to the east took place around AD75-80, completely changed the aesthetic landscape and the ordering of space (Figure 113). The Palace now covered the areas which previously housed the Proto-Palace, the granaries, the road system, and the unfinished masonry building (Figure 128). The orientation of the site and the ways people travelled through it must have completely altered.

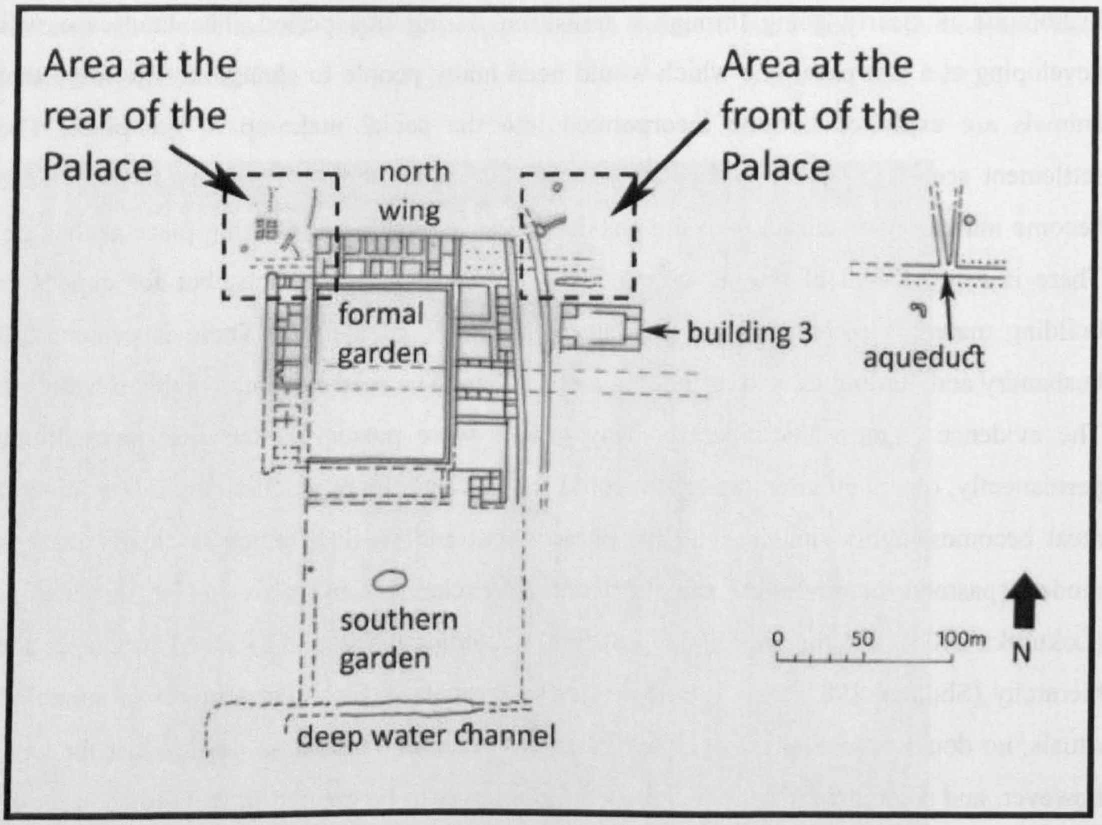


Figure 128; Plan of Palace site showing areas of faunal remains deposition, c.AD75-150.

In terms of animal bone patterning, differences between the front of the Palace, to the north east, and the rear of the building, to the northwest exist (Figure 128; Table 39; Figure 129). The relative frequencies of taxa suggest that the area at the rear of the Palace included higher frequencies of domestic fowl and mallard at the expense of cattle and sheep/goat compared to deposits at the front. Differences are also well demonstrated by pig skeletal frequencies from deposits in these areas (Figure 130). A lack of tibia elements suggests a slight preference towards the front limbs. Body part patterns from deposits in front of the Palace are representative of taphonomic bias which generally favours the mandible and humeri and calcaneus elements. The assemblage from the kitchen garden, however, shows evidence of selectivity. Foot bones were well represented from the kitchen garden. This may suggest that the carcass had been well processed before parts were moved to the rear of the Palace. Mandibles and humeri were minimal in this area indicating that the assemblage was anthropogenically influenced to a greater degree. The primary selection of foot bones, rather than reflecting initial stages of butchery waste, may be more reflective of cookery practices and table waste from this area. It is interesting to note that remains of deer antler were completely absent at the rear of the Palace. Whilst species of deer do carry antler in the summer these animals, like the pig, were probably carried out away from the site with food parts brought in for consumption.

Taxa	Front of Palace NISP	Front of Palace %NISP	Rear of Palace NISP	Rear of Palace %NISP
pig	533	7.9	207	31.7
cattle	323	4.8	54	8.3
sheep/goat	349	5.2	35	5.4
sheep	8	0.1	0	
goat	6	0.1	0	
horse	58	0.9	1	0.2
dog	14	0.2	2	0.3
cat	4	+	0	
red deer	17	0.3	11	1.9
fallow deer	1	+	1	0.2
roe deer	21	0.3	1	0.2
hare	34	0.5	13	2.0
fox	1	+	0	
cow-size	852	12.6	75	11.5
sheep-size	1248	18.5	102	15.6
domestic fowl	116	1.7	91	13.9
mallard	20	0.3	35	5.4
goose	3	+	5	0.8
wigeon	1	+	0	
teal	1	+	1	0.2
duck	4	+	1	0.2
woodcock	7	0.1	2	0.3
common crane	1	+	0	
moorhen	2	+	0	
gull	1	+	0	
woodpigeon	1	+	0	
redwing	1	+	0	
bird	57	0.9	7	1.1
fish	157	2.3	0	
unidentified	2914	43.1	10	1.5
Total	6755		654	

Table 39; NISP taxa between deposits in front of the Palace and at the rear of the Palace, c.AD75-150.

Figure 129; Relative frequencies of animals between the front and the rear of the Palace, c.AD75-150.

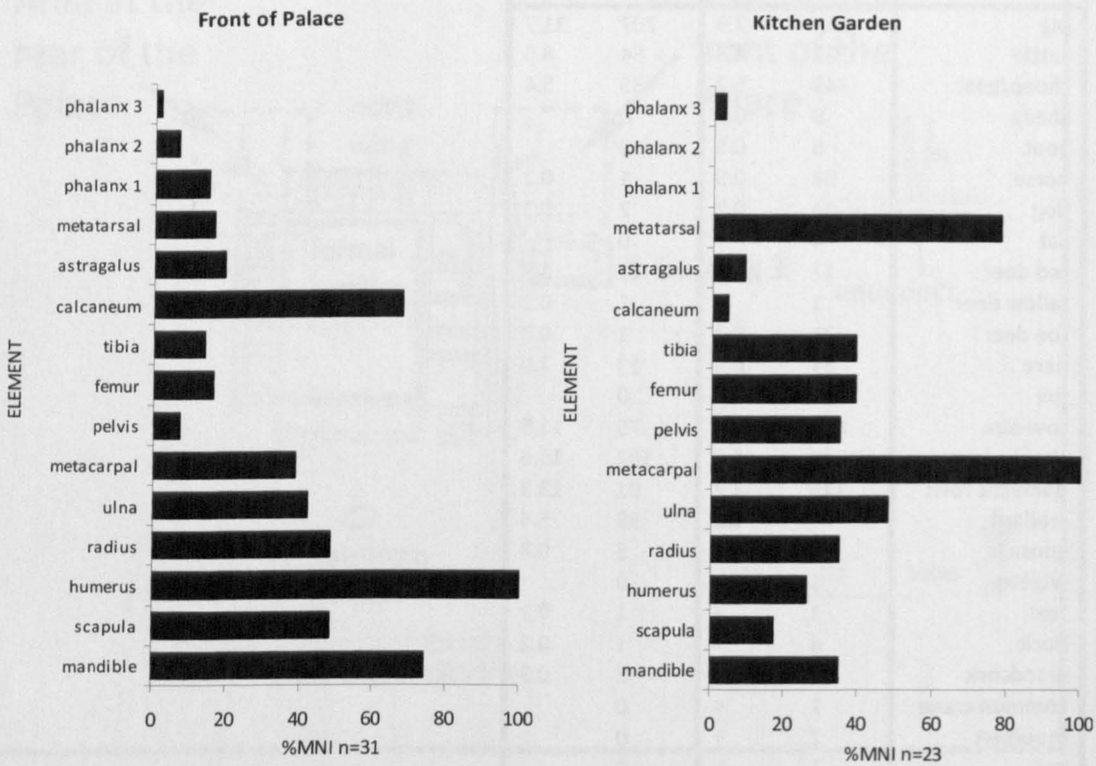


Figure 130; Pig skeletal frequencies from Fishbourne. Left: Deposits from the front (east) of the Palace; right: deposits from the rear (west) of the Palace.

Upon construction of the Palace much of the ditch which was present in at the rear of the Palace (see Figure 122 - marked 'Enclosure Ditch') was filled in whilst a shallow depth remained opened running east-west for the early period of Palace life. The wider area became largely gravelled over and a number of other features such as ovens and water piping led Cunliffe (1971, 135-7) to interpret the area as a kitchen garden to the Palace. The kitchen garden is a particularly understudied area of Fishbourne and rarely receives consideration in works or surveys of the site. Yet, if it was a kitchen garden, this must have been an incredibly prominent social arena of the settlement. Jones (2007, 229) is one author who has highlighted the importance of the kitchen garden placing emphasis on the aesthetic properties of the area.

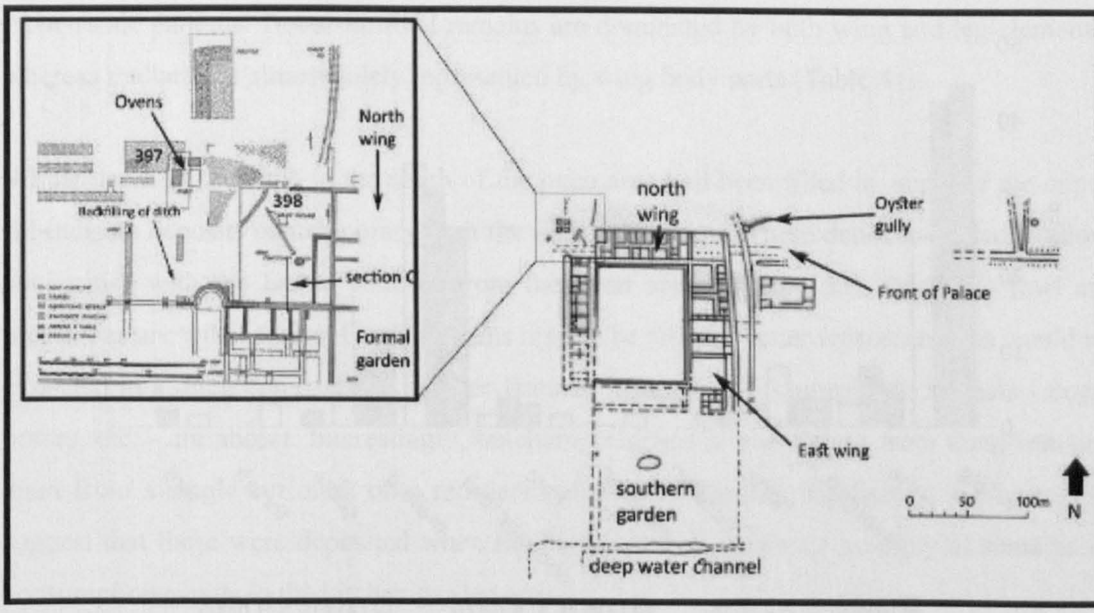


Figure 131; Plan of 'kitchen garden' area, c.AD75-100.

Trench 397 included an early gully within a gravelled area and a substantial kiln structure measuring *circa* 6x7m^2 including extensive flue systems and at least four cooking ovens. The faunal remains from this trench are dominated by pig, domestic fowl and mallard remains (Figure 132). The frequency of mallard bones, in particular, is not matched anywhere else on site. One of the goose remains was identified as a tarsometatarsus of a pink-footed goose. Layers 1 and 2 provided a large quantity of specimens from inside the flue system, presumably from remains which never made it out of the oven (Table 40). They were heavily mixed with charcoal and may have been pushed back into the system through cleaning of the ovens. 258 fragments in total derived from these layers and were exclusively remains of pig, domestic fowl, mallard, cattle, sheep/goat, hare and goose, quantified in that order. Remains from the surrounding gravel area and the fill of the adjacent gully show very similar patterns in taxa frequency to the bones in the flue system. Cunliffe (1971) dated the gravel area and ovens later than the gully due to a quantity of Claudio-Neronian pottery found within compared to Flavian pottery elsewhere. The zooarchaeological evidence indicates that the area may have been loosely contemporary and indicative of different actions within the space.

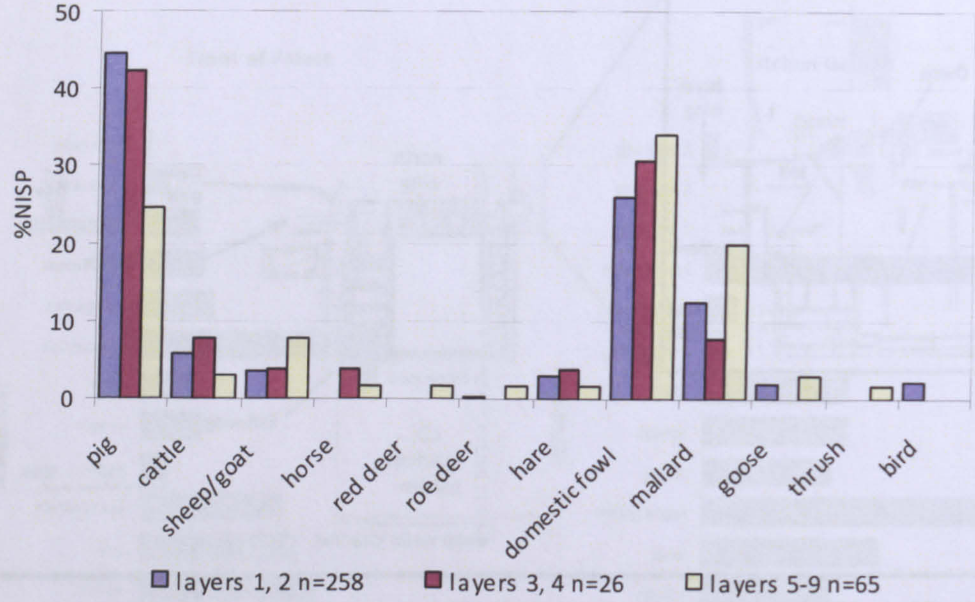


Figure 132; %NISP of identified taxa from trench 397.

Context	Context type
layers 1, 2	fill of flues mixed with large quantities of charcoal
layers 3, 4	gravel area
layers 5-9	fill of gully

Table 40; Contextual information for Trench 397

	dom. fowl		mallard	
Element	MNI	%MNI	MNI	%MNI
coracoid	2	8.7	0	0.0
scapula	0	0.0	0	0.0
humerus	11	47.8	2	9.5
radius	9	39.1	9	42.9
ulna	23	100.0	21	100.0
carpometacarpal	2	8.7	12	57.1
pelvis	0	0.0	0	0.0
femur	20	87.0	0	0.0
tibiotarsus	2	8.7	0	0.0
tarsometatarsal	22	95.7	1	4.8

Table 41; Skeletal frequencies for domestic fowl and mallard from Trench 397.

Only three specimens from the oven area show evidence of burning indicating the nature of the cooking; the food being baked in the oven rather than roasted over a fire. Furthermore, evidence of butchery is minimal. Only two specimens include chop marks: a pig metapodial and a pig scapula on the lateral side towards the articulating surface, presumably to cut through tendons to separate the blade from the shoulder joint. Three pig humeri show evidence of being deliberately broken, otherwise all the remaining butchery marks are knife cuts. The only repetitive butchery marks were knife cuts across the distal diaphysis of domestic fowl and mallard humeri. Skeletal frequencies also show anomalies to 'normal' taphonomic patterns. Domestic fowl remains are dominated by both wing and leg elements, whereas mallard are almost solely represented by wing body parts (Table 41).

Whilst much of the ditch to the south of the oven area had been filled in, some of the upper fill indicate deposits contemporary with the use of the ovens. These deposits tended to show similarities with the faunal patterns from the oven area (Figure 133). Domestic fowl are present, as are wild species. Cattle remains tend to be slightly better represented, as would be expected in a ditch compared to smaller features. Remains of 'companion' animals - dogs, horses, etc. - are absent. Interestingly, butchery evidence is also absent from these remains apart from a single cut mark on a red deer pelvis. The deposits highlighted in Figure 133 suggest that these were deposited when the Palace was in existence possibly as remains of consumption events in the kitchen garden area.

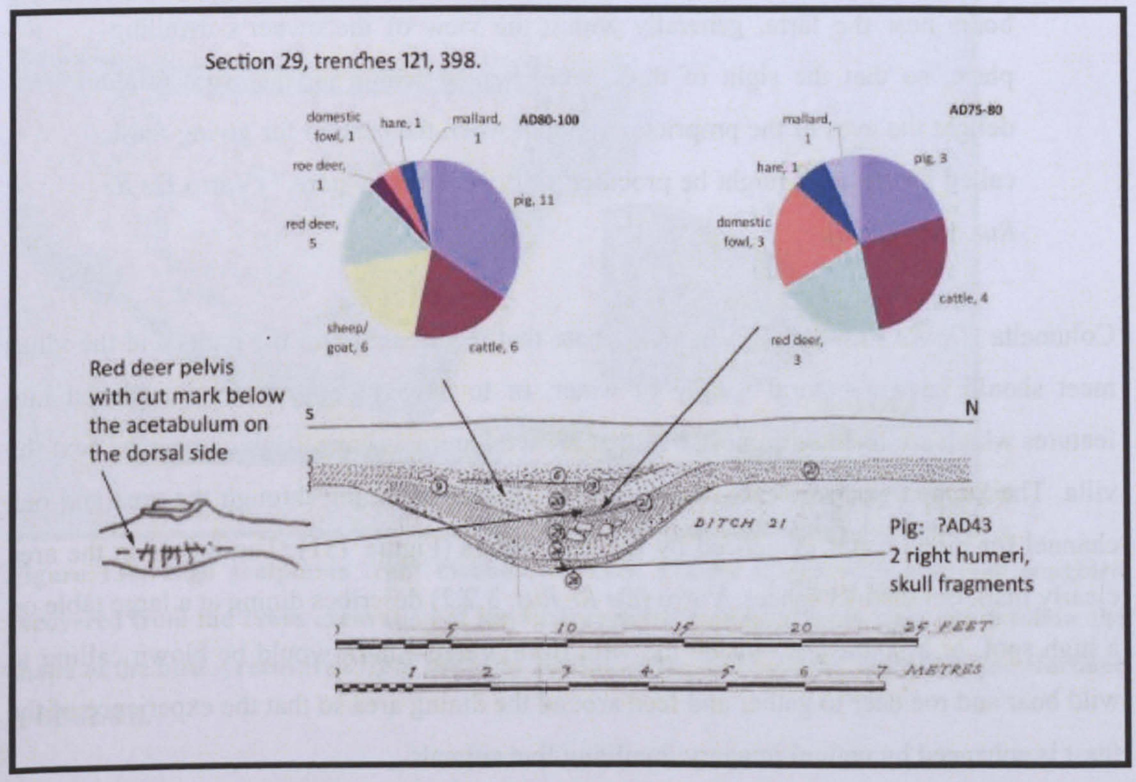


Figure 133; Location of bone deposits by phase in Section C displayed by taxa frequency.

Single pig mandibles were identified from each of the two deposits highlighted in Figure 133. Both were aged by dental development scoring via radiographs: one from the earlier deposit, specimen 10879, gave an estimated age of 3 months, the other from the later deposit, specimen 10867, gave an estimated age of 2 months. Both were dentally aged using the Grant (1975) method to stage A. Perhaps significantly, this provides some indication for the timing of these episodes in Area H. If as was argued in Chapter 3, the Fishbourne pigs were generally born around the month of May similar to wild boar, this would place the deposition of these layers to approximately July/August, around mid-summer. It is interesting that the stratigraphically adjacent deposits in the Area H ditch produced, not only very similar faunal deposits in terms of taxa frequency and taphonomic attributes, the production of neonatal pig specimens in each might suggest (pushing the evidence to its limits) that these were annual consumption and deposition events taking place to the rear of the Palace. Outdoor 'summer-eating' would be more in keeping with the life-style associated with a kitchen garden.

This evidence from the kitchen garden provides considerable context towards the social habits of the people living in the Palace. The visual aspects of Palace estate could be clearly observed and enjoyed from the comfort of the kitchen garden. The opening paragraph of Columella's Book IX is particularly apt here:

> "...since ancient custom placed parks for young hares, wild goats and wild boars near the farm, generally within the view of the owner's dwelling-place, so that the sight of their being hunted within an inclosure might delight the eyes of the proprietor and that when the custom for giving feasts called for game, it might be procured as it were out of store." (Varro *De Re Rus*. 9. Preface).

Columella (*De Re Rus*. 9.1/2) goes on to state that the areas where the parks and the villas meet should have a natural supply of water, or to have running water introduced into features which are lined with mortar so that the wild animals have drinking sources next the villa. The kitchen garden clearly has a number of gullies cutting through the area and one channel for piped water evidenced by the iron collars (Figure 131). The fences in the area clearly mark out distinct spaces. Varro (*De Re Rus*. 3.2.2) describes dining at a large table on a high spot, or a *palaestra*, outside the villa from where a horn would be blown calling to wild boar and roe deer to gather and feed around the dining area so that the experience of the feast is enhanced by natural imagery involving live animals.

The high frequency of mallard remains resonates with the instruction on building duck ponds by Varro (*De Re Rus*. 9.1-4) and Columella (*De Re Rus*. 8.15.1-7). The pond feature and surrounding wall in the southern garden provides a space akin to the descriptions given for these places. Certainly mallards seem to have been readily available compared to the odd specimens recovered from other wildfowl. The presence of thrushes in these deposits also hints at the construction of aviaries in the estate. Columella (*De Re Rus*. 8.10.1/2) suggests that whilst these were expensive and time-consuming they were kept by elites in many rural estates; even discussing the use of older thrushes by fowlers as decoys to calm the newly-caught wild birds once they have been 'hurled from the net into the aviaries.'

The imagery of birdlife seems to have been important to the inhabitants at Fishbourne from the sculpture of birds in the stucco which adorned the walls of the dining-halls inside the Palace (Figure 134). Such use of natural depictions was widely used within the villas of contemporary Italy (Carey 2003, 113-115). The link between the production of natural imagery and the consumption of a wider variety of animals seems apparent in this phase.

Figure 134; Bird sculptures from Fishbourne. Left: Plaster stucco with a carved songbird recovered from the 1960s excavation of the Palace; right: bird carving on bone cut to follow the shape of the bird – recovered from the early Roman courtyard building at Fishbourne Harbour (FBH82/83).

To the east of the Palace, excavation has suggested that activities continued to take place in front of the Palace. A relatively large quantity of animal bone was deposited in occupational debris and general spreads. Two contexts, however, deserve to be singled out. One linear feature, dating to *c.*AD75-150 and dubbed the 'oyster gully', deserves special mention. It is clearly set apart from other features in front of the Palace by the high frequency and range of fish species it contained. These have already been detailed in Chapter 3.13. This feature also contained a considerable quantity of bird remains and, as its name suggests, was rich in marine shell (*cf.* Somerville and Bonell 2006, 94-95). The 'oyster gully' was heavy with ash and charcoal and included an array of dining wares (Manley and Rudkin 2006, 75). A relatively high frequency of faunal remains from this feature had also been burnt.

Another similar feature was excavated south of the oyster gully and was known simply as the 'linear slot' (Figure 135). In the linear slot an articulated roe deer skull had been placed into the deposit, along with specimens of dog and horse teeth, with a number of mandibles from pigs and sheep/goats. Together this indicates that the material did not represent simply food waste deposition. The feature almost certainly dates to this period, though an Iron Age coin of Tincomarus (25-20BC) was recovered from its fill and would have been of considerable age at its time of deposition (Manley and Rudkin 2003, 48). Another find was a complete, although upturned, grey-ware pot. It is uncertain what this feature was, though the presence of two pits inside the slot suggests that horizontal timbers were placed with it forming a gate or boundary of some kind (Manley and Rudkin 2003, 50).

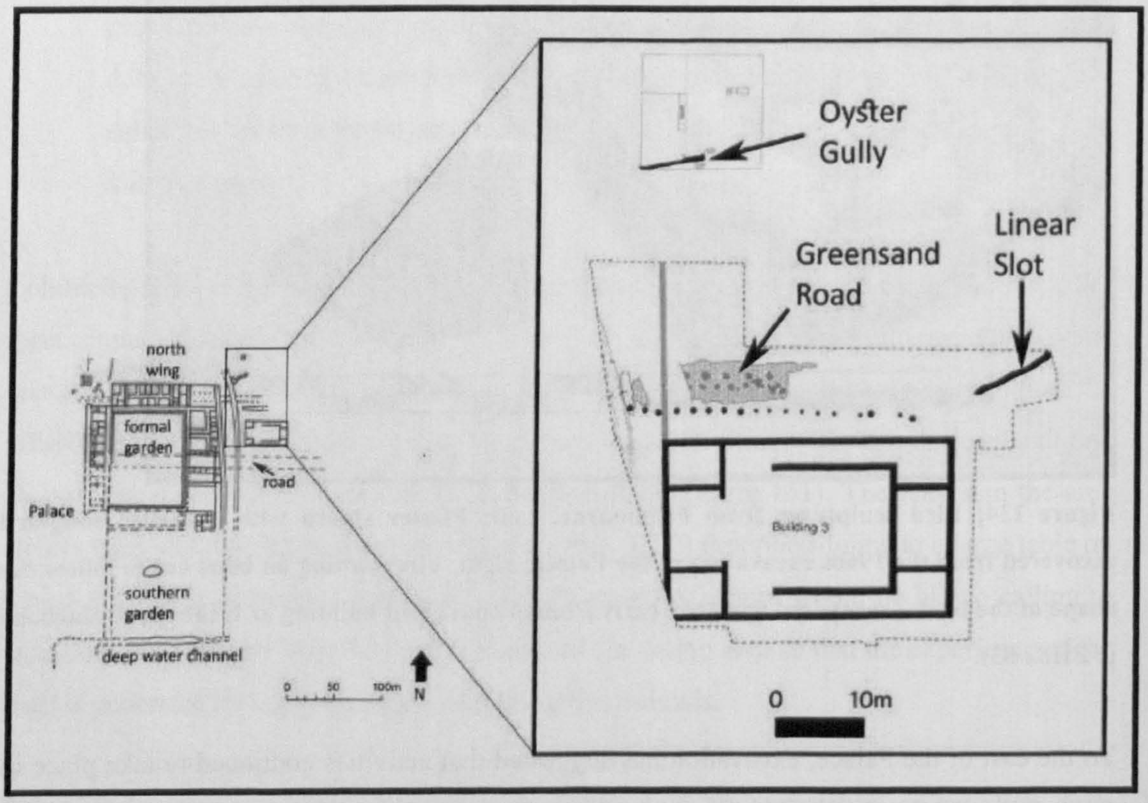


Figure 135; Plan of excavations and features in front (east) of the Palace including the 'oyster gully', the 'linear slot', and the greensand road.

The faunal remains from both the oyster gully and the linear slot provide indications of seasonal deposition. The majority of the fish species in the former are known to inhabit Chichester harbour estuary today through both the autumn and winter months for breeding. This context also included several species of wildfowl including teal, wigeon and woodcock.

Numbers of teal and wigeon tend to become more numerous in autumn and winter months and woodcock are traditionally trapped over the same period (Serjeantson 1998, 25). The tibiotarsus of a common crane, also an august/winter visitor, was excavated from a contemporary layer just north of the oyster gully. It must be noted here that 2 specimens of woodcock were also recovered to the rear of the building, though close to the wall of the Palace rather than in the ditch, gullies or oven area deposits. A sheep humerus from the oyster gully was close to full epiphyseal fusion, an element which fuses around 5-6 months (Getty 1975) which, if born in spring, places the death of this animal around September. Within the linear slot an articulated roe deer skull had been interred. The antlers from both sides of the skull look to have been shed though skull fragments suggested indicate that these were at the point of shedding and were still attached to the skull at the time of deposition (Figure 136). Roe deer usually shed their antler between October and December. Together the evidence places the deposition of the fills of these features around late autumn or early winter.

Figure 136; Roe deer skull fragments at the antler articulation. Both specimens recovered from the linear slot (FBE99-02).

The seasonal data suggests that a separation in the timing of activities was evident between the front of the Palace (autumn/winter) and the rear of the building in the area of the kitchen garden (summer). Both faunal assemblages are intricately linked to eating animals from the estate. The majority of the remains from the kitchen garden area are restricted to pig, domestic fowl and mallard (Figure 132). Hare, red deer and roe deer were present in these deposits, though if we accept the historical evidence of the relationship between outdoor dining and the visual experience of the wider Palace estate, it suggests that the feasting was simply part of a wider landscape performance; one where wild animals were more important as visual objects. In this way, the animals became 'specimens' to be viewed from a distance. The outside of the Palace was just as much a part of the architecture of the settlement as the inside. According to Malamud (2007, 223-225) the spectator-specimen relationship of animal watching is one of human power over its subjects. Simply watching animals of the estate would come to reflect the imagery of 'outside nature', with the separation between the 'spectator' and the 'specimens' representing a culture/nature division. The conceptual dualism inherent in watching animals is captured by Berger (2007, 253 – original emphasis) who suggests that, in this way, animals are 'subjected *and* worshipped, bred *and* sacrificed', perceptions which lie with people 'who live intimately with, and depend upon, animals.' The landscape is, in this way, constructed and conceptualised to transmit a cultural ideal (*cf.* Knapp and Ashmore 1999; Loney and Hoaen 2005).

The timing of slaughtering of animals is not always based on sound economic rationale and, although this is where I based my discussion of the data in Chapter 3, the slaughtering domestic animals in most societies is driven by social events (Ervynck 2005, 153). However, the slaughter of animals, in general, is rarely viewed in terms of seasonal changes from a social perspective; in archaeological/anthropological literature these are more commonly viewed as being *determined* by environmental changes (*cf.* O'Shea 1989). The rationale for lambing seasons seems to be tied into the workings of the Roman farm. This point is illuminated by Columella (*Res Rus.* 7.3.10-12) who states that the earliest ewes should be mated is in spring when 'the *Parilia* is celebrated', though ewes who have previously given birth it should be in July. He suggests however that the earlier time is preferred so that lambing in autumn is after the vintage which is after the harvest. The lambs can then enjoy a bountiful surplus of food to gain strength prior to the winter months. Obviously the timing of sheep reproduction in this context is based on a Mediterranean cycle, but the cycle of sheep life on settlements is a constant negotiation between social festival and seasonal change. Both are tied to perceptions of the environment.

Harvesting the produce of the farm was clearly important, as detailed by the agronomists, and highly structured by annual timings (Varro *De Re Rus.* 1.27-34). Cato (*De Re Rus.* 134) stresses the importance of sacrificing a sow to Ceres before any harvesting can take place. The autumn and winter deposits at the front of the Palace suggest a relatively wide variety of environments on the estate were harvested after a summer of produce. It is also widely known that oysters tend to be harvested between September and December in Britain in recent times following their spawning in June/July (Power 1970). The high frequency of shell and fish in the oyster gully suggest a harvesting of the estuaries (Figure 137).

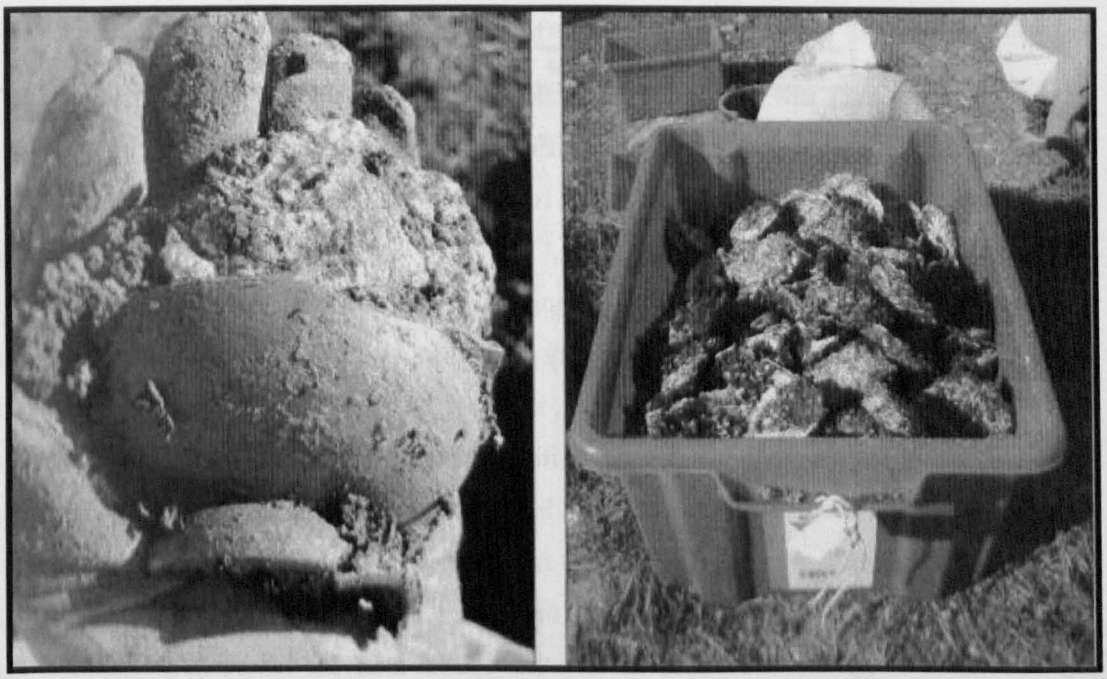


Figure 137; Left: oyster shell fragments deposited in Samian ware cup. Right: Sub-sample of oyster shells. Both deposits derive from the oyster gully east of the Palace (after Manley and Rudkin 2003, 77, figs. 21 and 22).

The disjuncture between the deposits at the front and the rear of the Palace may, though not rigidly, represent a difference between eating outdoors and indoors. The seasonal differences in consumption practices and other social practices seem to have been played out and reflected in the orientation of the Palace and its landscape. A biannual movement is indicated from winter consumption indoors, connected to the deposition of remains at the front of the Palace, and so presumably in a public way, towards the more private kitchen garden, from where the estates animal inhabitants could be seen and admired. The social pattern of time is ingrained in both the settlement and its animals. The changing seasons are a biological background which is *played with* culturally. Drawing upon the phenomenology of Heidegger and Husserl, Gosden (1994, 122) argues that time is not a series of 'nows', but a reference to 'befores' and 'afters'. 'All action takes place in anticipation, which is derived from past experience' (*ibid.*). I would go one step further to argue that this is placed back into the environment, through deposition, reforming the landscape with each event. The deposits in the oyster gully and the linear slots indicate a level of ritualisation such as the upturned pot, the articulated roe deer skull, or the oyster cup (Figure 137). In the vein of Bradley's (1991, 120) argument, ritual helps to take social formations out of time and make them appear natural. Hunting, fishing, and killing farm animals are carried out in anticipation of the feast. The burial of that episode creates memory and ritualises the time spent and practices carried out, in effect creating the history of the settlement and its landscape.

4.3.4 c.AD150-300

The 2nd century AD saw continued redevelopment of the Palace. These changes were sporadic, taking place in separate areas at different points in time. The north wing seems to have become the main living quarters, being restructured to become a self-standing building around the mid-2nd century (Cunliffe 1971, 158-172). The other wings were maintained separately though they underwent some changes in function. Permanent occupation of the site ceased towards the end of the 3rd century AD. Post-AD280 was a period of demolition and robbing throughout the site. Once more, different areas of the site show differences in the ways that animals were being engaged with (see Figure 138 for the areas analysed). The species proportions suggest that cattle and horse were better represented away from the Palace at the aqueduct area whereas higher frequencies of bird bones were a signature of areas close to the Palace (deposits in front of the Palace and the inner garden area) (Table 42; Figure 139). This pattern is reminiscent of other spatial analyses where larger animals are found in greater quantities further from the settlement, whereas finer debris is a feature of the dwelling areas (Wilson 1996; Sykes 2007a). However, these relative frequencies reveal little on their own and, again, closer inspection of the contexts is needed to understand the subtle differences in social practice between each.

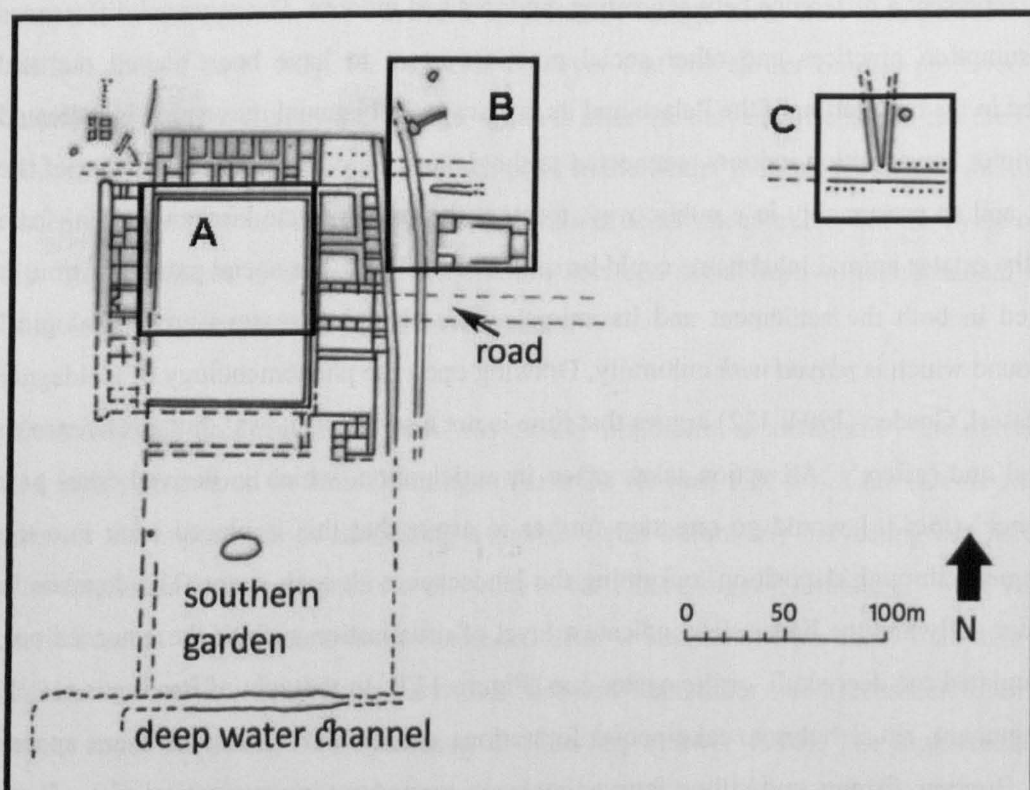


Figure 138; Main area of animal bone analysis. A = Garden midden; B = Front of Palace; C = Aqueduct area.

Taxa	A: Garden Midden		B: Front of Palace		C: Aqueduct Area	
	NISP	%NISP	NISP	%NISP	NISP	%NISP
pig	107	14.7	107	10.5	192	9.4
cattle	115	15.8	88	8.6	360	17.6
sheep/goat	94	12.9	67	6.6	152	7.4
goat	0		1	0.1	0	
horse	12	1.6	2	0.2	53	2.6
dog	3	0.4	4	0.4	15	0.7
red deer	18	2.5	20	2.0	32	1.6
fallow deer	5	0.7	3	0.3	3	0.2
fallow/red deer	1	0.1	0		2	0.1
roe deer	10	1.4	0		8	0.4
hare	4	0.6	0		0	
bear	0		0		1	0.1
badger	0		0		1	0.1
cow-size	149	20.4	232	22.7	436	21.3
sheep-size	145	19.9	280	27.4	353	17.3
domestic fowl	23	3.2	10	1.0	9	0.4
mallard	1	0.1	6	0.6	0	
wigeon	1	0.1	0		0	
tufted duck	1	0.1	0		0	
velvet scoter	1	0.1	0		0	
goose	1	0.1	2	0.2	0	
woodcock	2	0.2	0		0	
common crane	1	0.1	0		0	
woodpigeon	0		1	0.1	0	
bird	9	1.2	5	0.5	2	0.1
unidentified	27	3.7	195	19.1	427	20.9
Total	730		1023		2046	

Table 42; NISP taxa between deposits from the garden midden, in front of the Palace, and at the aqueduct area, c.AD150-280.

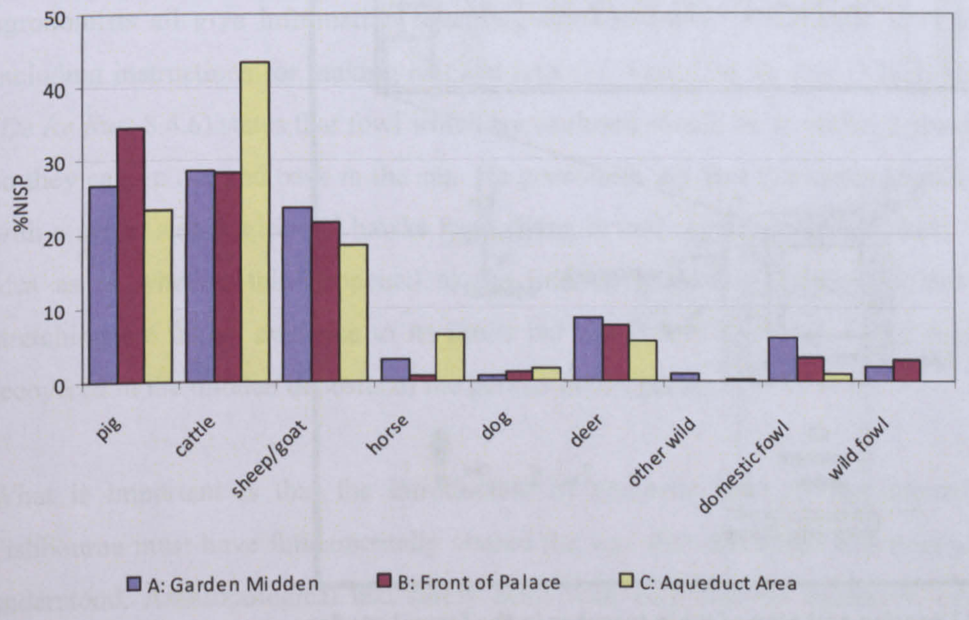


Figure 139; Relative frequency of taxa between different areas of Fishbourne, c.AD150-300.

The once well-kept gardens in the courtyard of the Palace later became a midden area for waste behind the restructured north-wing. The development and subsequent use of the formal garden coincided with new areas for depositing quantities of faunal remains. These were largely deposited in the north-western corner of the garden (Figure 140). The remains are reminiscent of the table waste found in other areas of the site. Cut and chop marks were minimal and were almost exclusively found on meat-bearing elements from sheep/goat and pig. Cut marks were observed on a crane humerus, a roe deer humerus and on various specimens of domestic fowl. A red deer scapula had been trimmed on the dorsal edge and metapodial specimens also included knife marks. Venison seems to have continued to make up a considerable proportion of the meat diet. The presence of several migratory birds, including crane, velvet scoter, tufted duck were present in these deposits along with woodcock, goose, and wigeon, indicating that wildfowling continued to be a practised past-time, as well as an indication of winter-dining in the north wing.

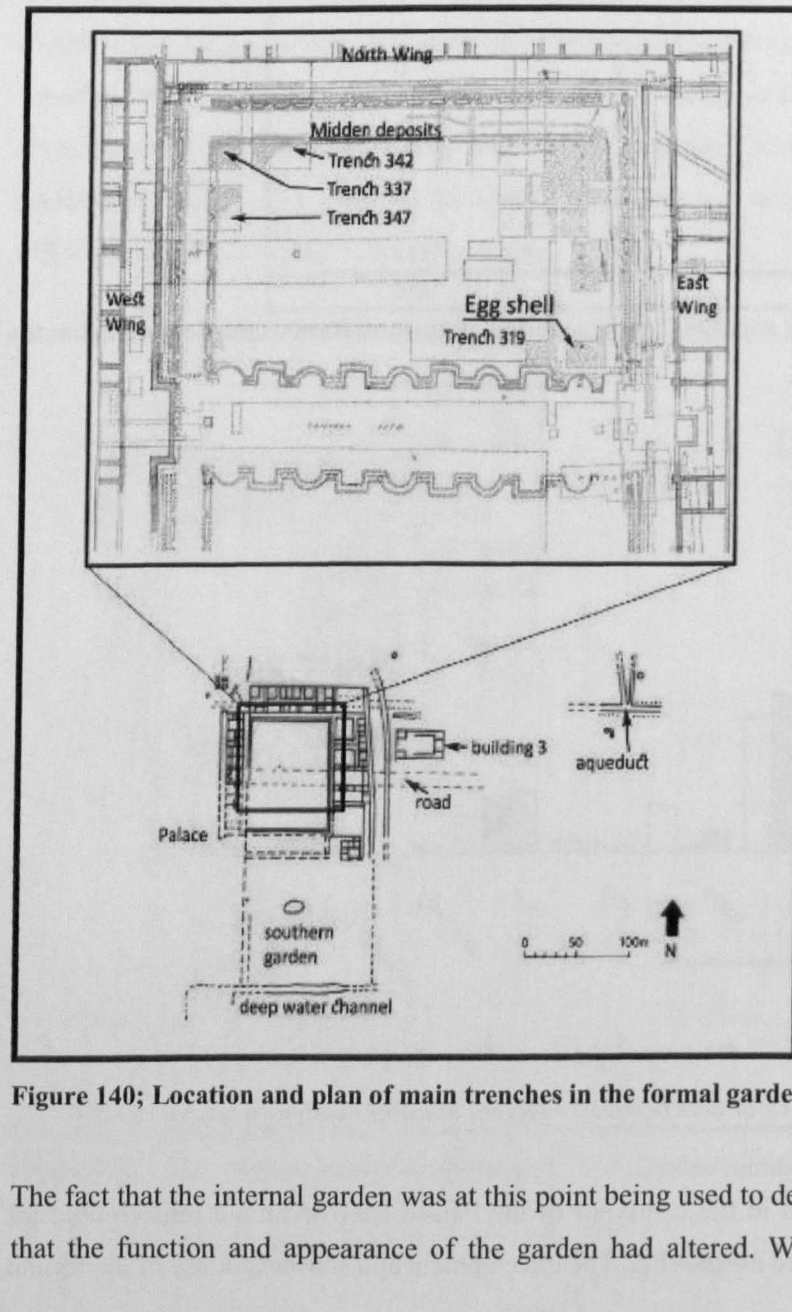


Figure 140; Location and plan of main trenches in the formal garden.

The fact that the internal garden was at this point being used to deposit dining waste suggests that the function and appearance of the garden had altered. With the dining waste being deposited in one corner it indicates that the rest of the garden may have been structured and used in other ways. One important find from this area in this phase has been the recovery of eggshell from a trench in the central part of the eastern side of the garden. This is the only find of eggshell from the site. Eggshell is notoriously difficult to recover from archaeological sites without the aid of fine sieving strategies. It is of note however that no find of eggshell was recovered from the excavations at the front of the Palace where wet sieving was employed. The find of eggshell form the internal garden is then even more important. As noted from the domestic fowl data in Chapter 3, the existence of laying hens are found from evidence of medullary bone in numerous domestic fowl femur and tibiotarsus specimens. It must be noted here that the shell has, so far, not been identified to species. The relation of the shell to domestic fowl is based on the medullary bone data and the relatively high frequencies of domestic fowl at Fishbourne as a whole. The breeding of domestic fowl at Fishbourne is also a reasonable suggestion in light of these data. The presence of male domestic fowl is indicated by the biometric data set out in Chapter 3. Sibun (2003, 127) observed spurs on two of the four domestic fowl tarsometatarsi she examined. I did not find any from my own analyses, though these could have become broken or been lost by this time. It does suggest, however, that male cocks were present.

Whilst the recovery of eggshell could derive from food waste, this was not a feature of this area of the garden. Rather it could be that domestic fowl were introduced to the internal garden where they could live and breed in relative safety from predators. The Roman agronomists all give information regarding the husbandry of domestic fowl on the farm including instructions for making chicken runs (*cf.* Varro *De Re Rus.* 3.10.1-4). Columella (*De Re Rus.* 8.4.6) states that fowl which are enclosed should be so within a spacious portico so they can go out and bask in the sun. He goes on to say that this space should be covered with a net to stop eagles and hawks from flying in and capturing hens. Clearly we have no idea as to whether this happened to the internal garden at Fishbourne and it may be stretching the faunal evidence to its limits but the find of the white-tailed eagle was also recovered in the midden deposits of the garden in this phase.

What is important is that the introduction of domestic fowl to the internal garden at Fishbourne must have fundamentally altered the way that this space was engaged with and understood. Anthropological text rarely deals with such themes. However, one insightful discussion is given by Sykes (2009) in an article where the emotive properties involved in introducing chickens to a garden, one which previously had no domestic fauna, are clearly felt.

> "They have rapidly and increasingly transformed the space since their arrival: its look, smell and feel have changed – it is a different space. This is also reflected in the way that we now engage with the space – we spend more time in the back garden but our patterns of movement within it have also changed as we collect eggs, attempt to avoid the deep dust bowls and avoid or collect the genuinely awesome quantities of shit produced by these small animals" (Sykes 2009, 23).

Archaeological site plans reveal certain social aspects, such as the construction, division, and interaction between different spaces in 'Roman' houses (*cf.* Perring 2003), though it is the evidence from faunal remains which really enhance our understanding of those spaces in terms of how people thought and felt. Of course the domestic fowl has other properties. Its integrated use of sound and time-keeping would have had a similarly dramatic effect on the inhabitants at Fishbourne. Pliny (*Hist. Nat.* 10.24) notes of the cockerel: 'Nearly equally proud and self-conscious are also our night-watchmen, a breed designed by nature for the purpose of awakening mortals for their labours and interrupting sleep.' Pliny believed the bird to have been a skilled astronomer and so mediated between the gardens and the heavens. Its crowing was not simply noise but the bird's 'song', which it uses to herald the coming day and marking every three-hour period with it. The introduction of chickens into internal spaces of the farm villa was noted by Varro (*De Re Rus.*3.3.5): 'The rearing of the...chickens, was the first to be attempted within the villa; for not only did Roman soothsayers raise chickens first for their auspices, but also the heads of the families in the country.' The inhabitants of Fishbourne no doubt experienced similar phenomena to both Sykes and the agronomists when introducing domestic fowl into the gardens there.

The high number of species represented at Fishbourne indicates the variety and multitude of networks and pathways used at the site, both *inside* and *outside*. Transport is a notion which becomes more vivid during the latter period of Palace life. As shown in Chapter 3 horse remains are more frequently represented in this period of the settlement. The road system at Fishbourne seems to have been highly developed from an early phase (Cunliffe 1971, 38-39; 55-56). The greensand road which was excavated east of the Palace and north of Building 3 provides clear evidence of transportation to and from the Palace. Wheel-ruts are evident in the surface of the road running parallel with a series of large post-holes (Figure 141). These date to around the middle of the second century (Manley and Rudkin 2003, 41).

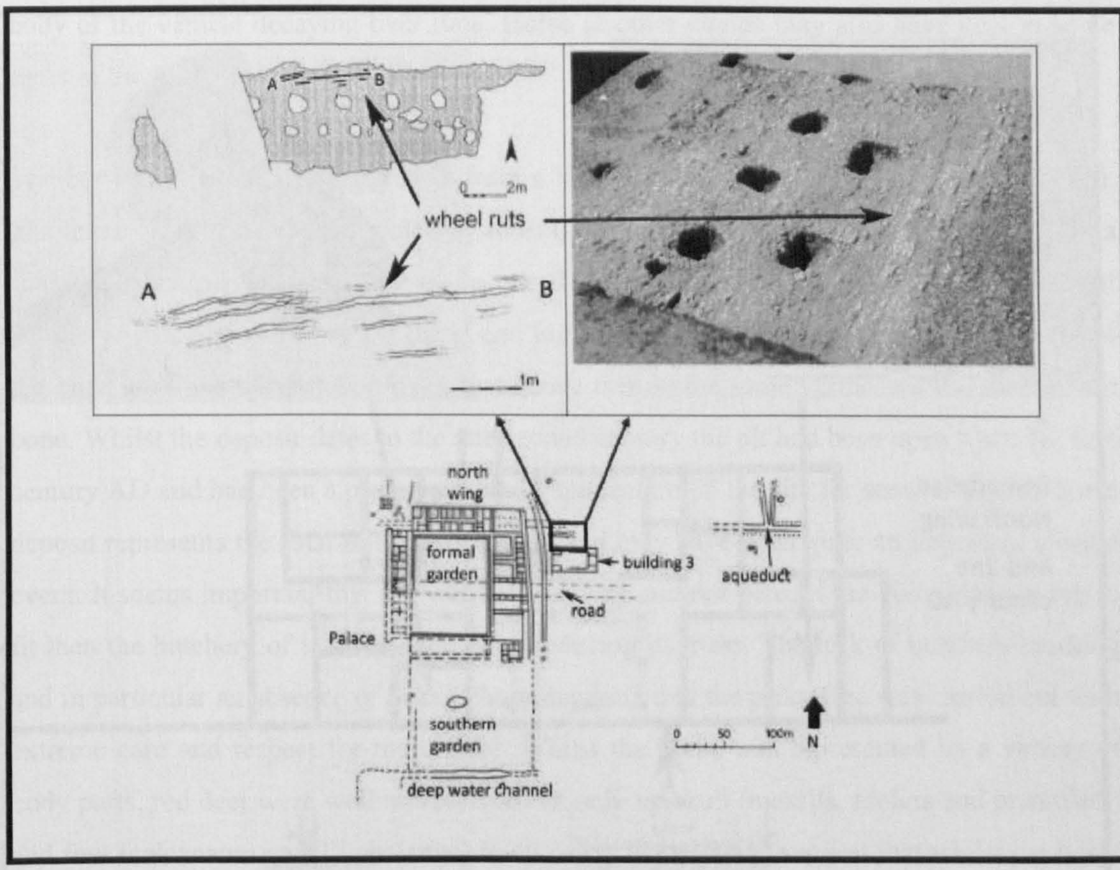


Figure 141; Position of wheel rut impressions on the greensand road leading to the front of the Palace, c. mid-2nd century AD (upper excavation plan and photo have been reworked here and derive from Manley and Rudkin 2003, 41, figs.84 and 85).

The role of horses in the Roman Empire as primary mediators of transport is well attested (Clutton-Brock 1992, 118; Hyland 1990; Johnstone 2004). The movement into and out of high-status farms in the Roman period seems to have been highly regulated. Varro (*De Re Rus.* 1.16.5-6) can be quoted as saying:

> "…no one shall leave the farm without the direction of the overseer, nor the overseer without the direction of the master, on an errand which will prevent his return on the same day…a farm is rendered more profitable by convenience of transportation if there are roads on which carts can easily be driven."

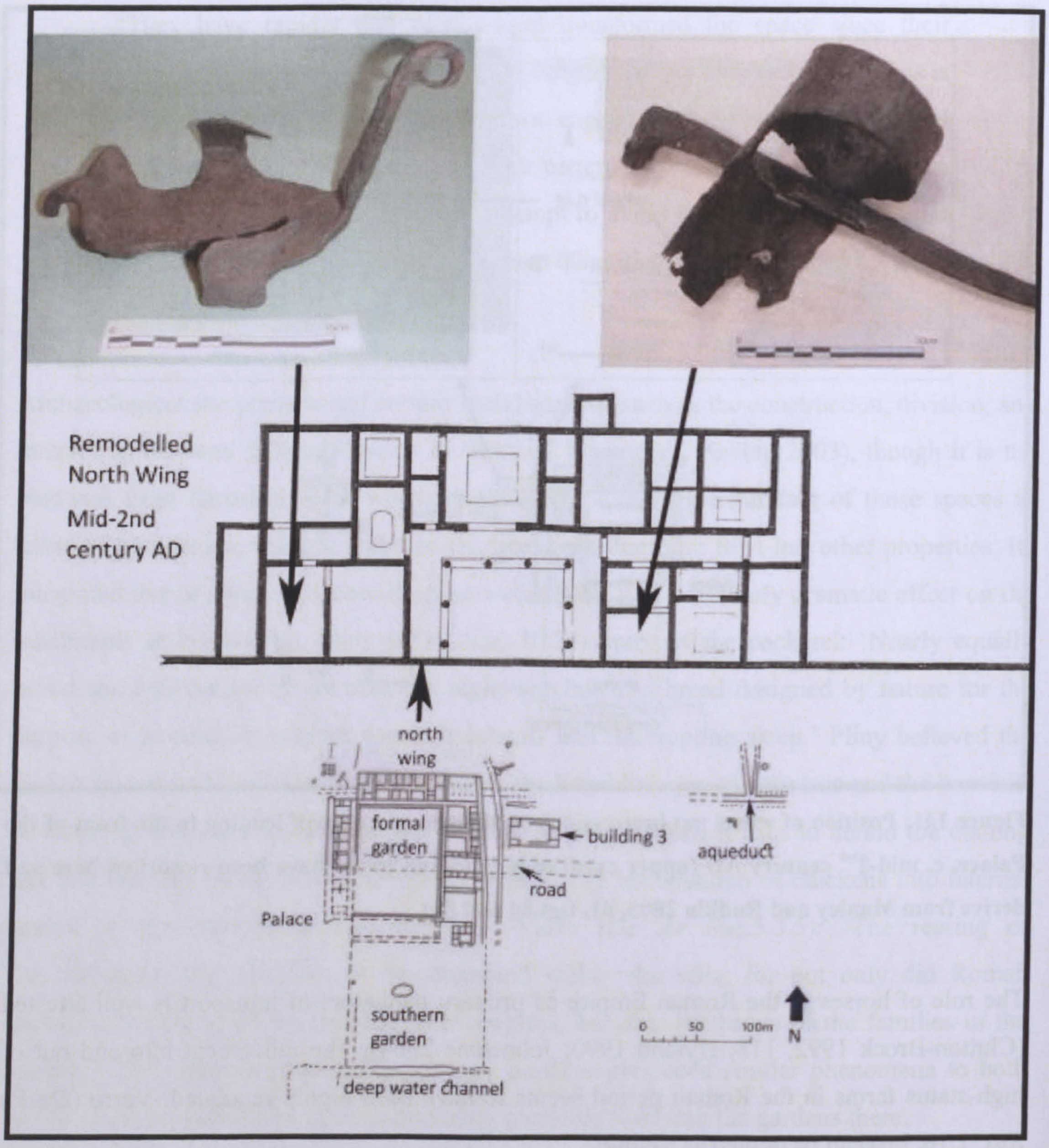


Figure 142; Location of horse and cart artefacts within the north wing of the Palace, c. mid-late 2nd century AD. Top left photo: hipposandal or horseshoe of a style brought into Britain after AD43. Top right photo: axle cap from a cart with holding pin.

It is rare, however, that these movements through and between settlements are present in the archaeological record. The wheel ruts at Fishbourne demonstrate an inscribing of human and animal movement into the landscape of the settlement. Other horse and cart artefacts are also evident from this phase. Three hipposandals (Roman horseshoes) were recovered on the floor surface of room 12 in the north wing and two axle caps from a cart were recovered from the floor surface of room 3 in the north wing. Both these sets of artefacts lay beneath later demolition deposits indicating that these spaces functioned as places to store these artefacts. The position of the axle caps suggest that a cart was buried *in situ* with the main body of the vehicle decaying over time. Horse or other equids may also have kept in some areas of the Palace after its modification.

The burial of a horse was excavated from a large pit, 909, during this phase (Figure 143). The horse remains were represented by most body parts and MNI calculations suggest that a single animal had been interred in the pit. The left femur of the horse showed signs of butchery with cuts marks at the distal end indicative of severing of the medial ligament of the knee joint and a light chop mark just above this on the same surface on the shaft of the bone. Whilst the deposit dates to the late second century the pit had been open since the first century AD and had been a prominent landscape feature on the site for some time. The horse deposit represents the final infilling of the pit and may have been quite an important closure event. It seems important that the whole horse was interred here. If the body was too big to fit then the butchery of it carcass aimed at reducing its mass. The lack of butchery marking and in particular an absence of heavy chops suggests that the procedure was carried out with extreme care and respect for the animal. Whilst the horse was represented by a variety of body parts, red deer were well represented but only by skull (maxilla, molars and premolars) and foot (calcaneum and 1st phalange) body parts. The remains suggest that whilst the horse was importantly interred almost whole, the red deer had been processed with the remains from the initial butchery stage placed in the deposit along with the horse. The remaining parts of the deer had presumably moved elsewhere to be consumed.

The link between horse and deer in ritual deposits has been seen elsewhere from Roman Britain, particularly from the shrine at Bancroft, Buckinghamshire (Holmes and Reilly 1994), and the complex of deposits at Witham, Essex (Luff 1999, 205) where remains were sometimes in association with dog teeth. The burial of horse and red deer body parts at Bancroft seems to have been in association with spear heads which suggested to the excavators that a hunting element formed part of the local cult (Holmes and Reilly 1994, 517, 535-536).

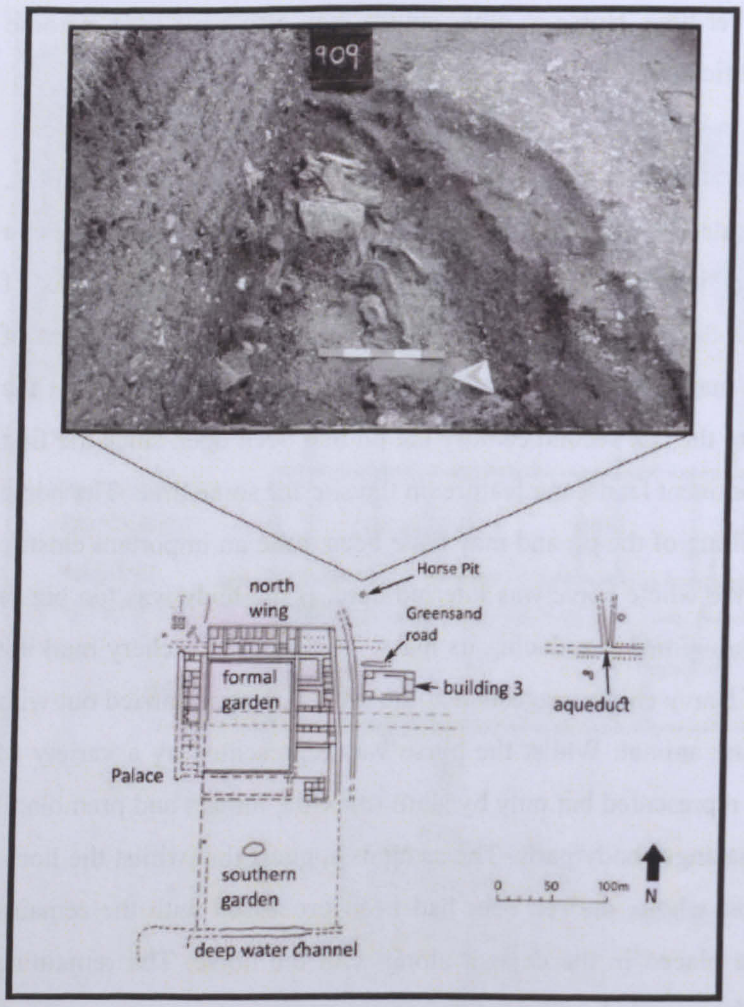


Figure 143; Contents of horse pit (photo from Manley and Rudkin 2003, 85, fig.162).

Taxa	NISP
horse	64
red deer	15
cattle	10
pig	15
sheep/goat	11
dog	1

Table 43; Number of identified specimens by taxa from the northern pit, 909, c.AD 150-200.

At Fishbourne the large pit did not include hunting paraphernalia. However, contemporary finds of prick spurs and spearheads were recovered inside the east wing of the Palace (Figure 144). These artefacts were buried in the corners of separate internal courtyards. Together the finds from all these deposits hint at the importance of the horse as a primary and active agent in moving people through the Fishbourne estate. Differences in horse equipment give the horse alternative meaning, and appearance, from the transporter of people and goods with the hipposandals and the cart, to the association of the hunter with the prick spurs and the spear. The separation of the horse-associated artefacts into the north and east wings further emphasises the conceptual difference between forms of horse usage.

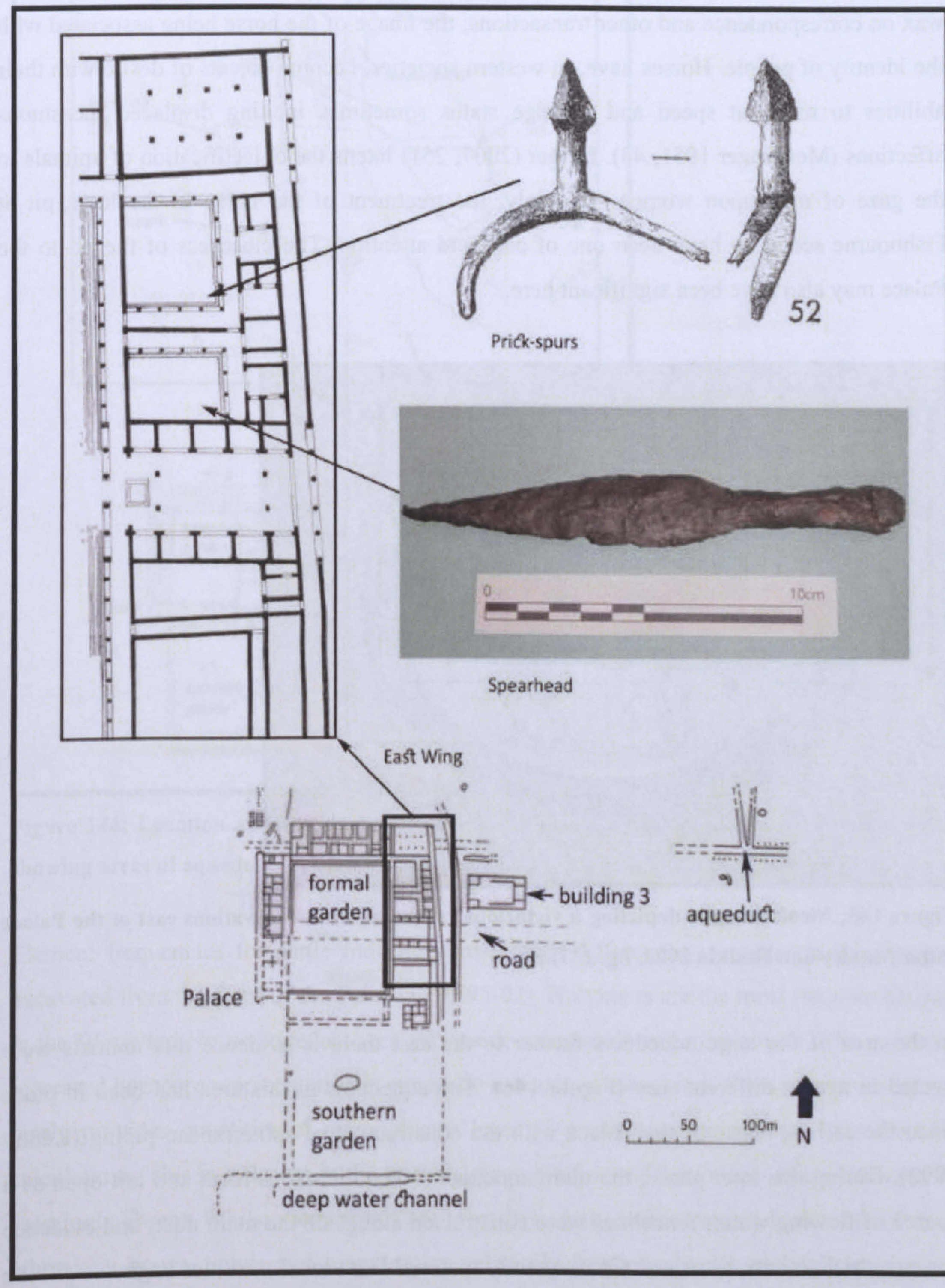


Figure 144; Location of prick spurs and hunting spear in the courtyards of the east wing of the Palace, c. mid-late 2nd century AD. Top illustration: prick spur from Cunliffe 1971, 135, fig.52. Bottom photo: hunt spear taken by author.

Horses were clearly important in the Roman period as both 'beasts of burden' and animals of prestige. The intaglio from a finger ring recovered from an unstratified context east of the Palace includes the engraving of a victorious racehorse and is common in the early Roman period (Figure 145; Henig 2003, 112-113). Such an artefact would have been used to seal wax on correspondence and other transactions; the image of the horse being associated with the identity of people. Horses have, in western societies, become objects of desire with their abilities to move at speed and prestige status sometimes inciting displaced incestuous affections (Menninger 1951, 43). Berger (2007, 251) likens the objectification of animals to the gaze of men upon women. Certainly, the treatment of the horse in the large pit at Fishbourne seems to have been one of care and attention. The closeness of the pit to the Palace may also have been significant here.

Figure 145; Nicolo intaglio depicting a victorious racehorse from excavations east of the Palace (after Manley and Rudkin 2003, fig. 237).

In the area of the large aqueducts further to the east there is evidence that animals were treated in a very different way (Figure 146). The aqueducts in this area had been in place since the earliest phase of the Palace with the construction of subterranean piping (Kenny 1992). During this later phase, the main aqueduct (108 and 141) is recut and left open as a source of flowing water; fencelines were constructed alongside the main duct; and evidence for industrial activity increases. Consequently material from local activities begins to fill the ditches and also become washed into a large overflow running south from the ditch. Large deposits of animal bone become a feature of these contexts. Remains from large and medium-sized mammals dominate, cattle in particular, whilst birds and small mammals are rare.

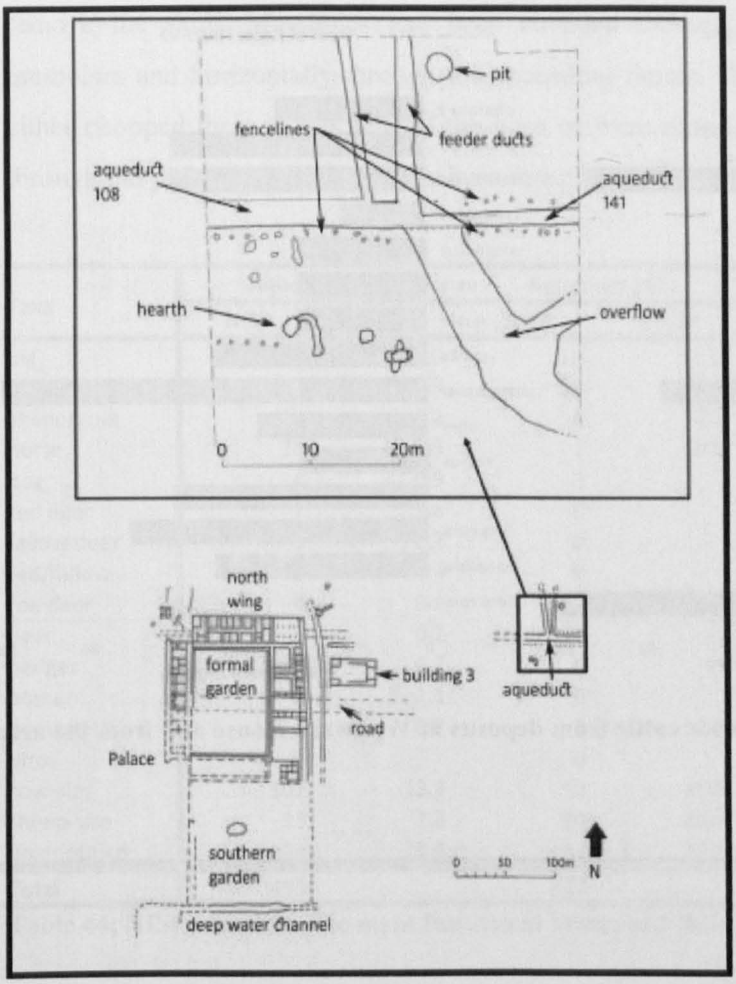


Figure 146; Location and site plan of Westward House excavation east of Fishbourne Palace showing areas of aqueducts and industrial features (site plan redrawn from Kenny 1992).

Element frequencies for cattle indicate considerable differences to contemporary material excavated from the front of the Palace (FBE95-02). Horncores are the most frequent element in the Westward House/aqueduct area, alongside metatarsals and metacarpals. The pattern of increased horncore representation is generally unusual as horncore is highly fragmentary and rarely provides quantities of material at a level of preservation to give comparable MNI calculations. This is reflected in the material from the front of the Palace where horncore are seemingly absent. Whilst metacarpals are most frequently represented in front of the Palace, other long bones, pelvis and scapulae are relatively frequent. In the aqueduct area, meat-bearing elements are lower by comparison. The high levels of horncore and metapodia in the aqueduct area indicates that these deposits most likely represent the remains from primary cattle processing.

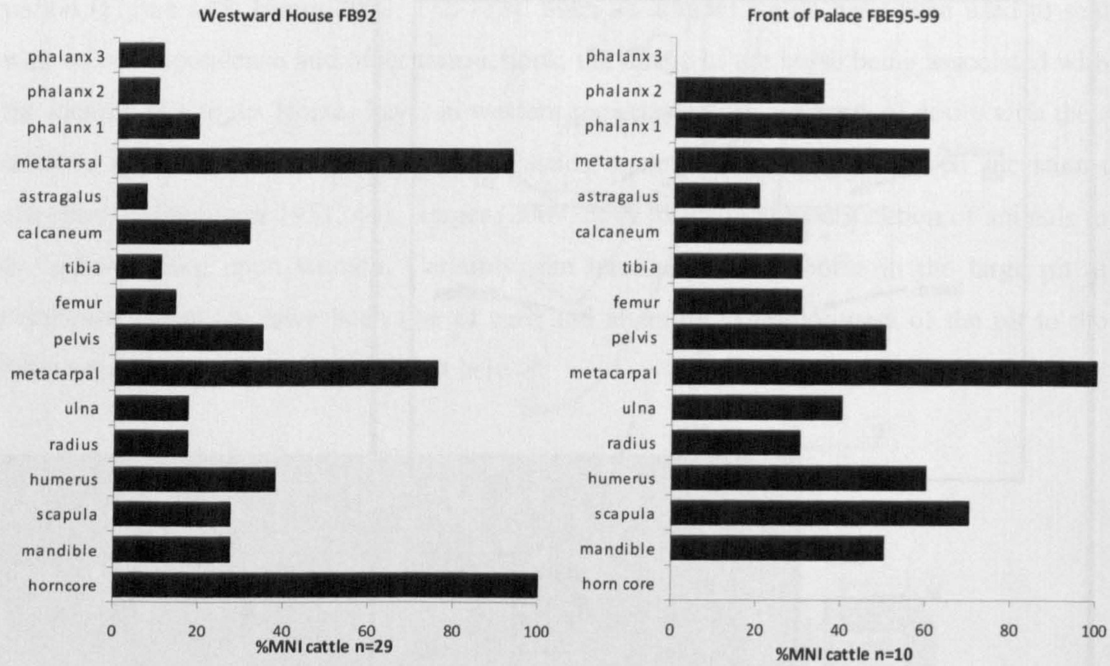


Figure 147; Skeletal frequencies for cattle from deposits at Westward House and from the area in front of the Palace.

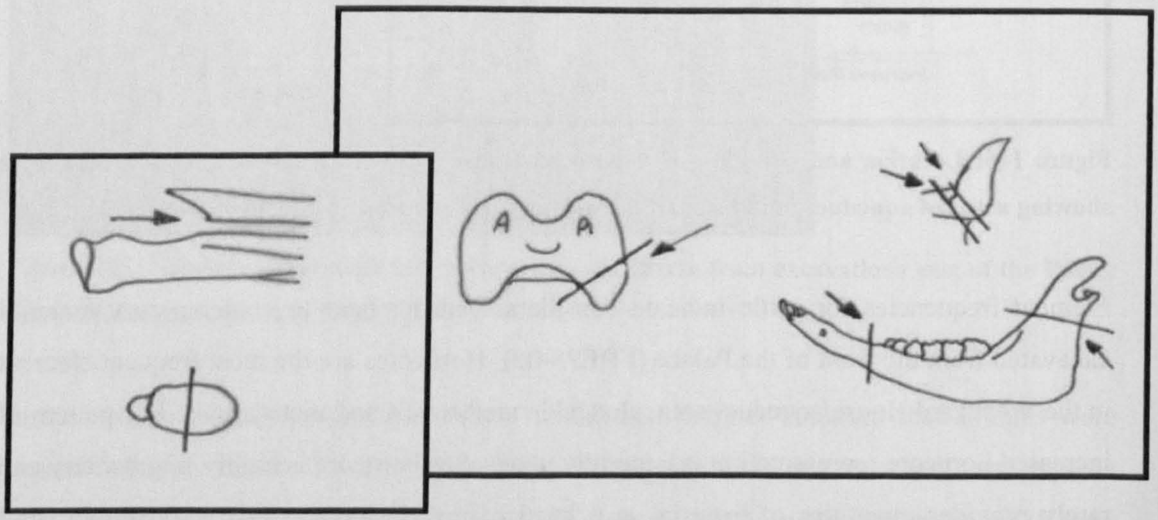


Figure 148; Locations of repetitive butchery (chop) marks on cattle remains at Westward House, c. AD150-300. Left: Removal of the scapula spina and axial split of the scapula through the articulating surface. Middle: Chopped through the dorsal ridge on the atlas. Right: The horncores either removed from the skull being chopped traversely through the base of the horn or through the frontal and parietal on the skull.

Cattle remains in this area also show some quite distinctive types of repeated butchery marks. The most common are two chops on the scapula; one aiming towards the caudal edge to remove the spina and the second is a cleaver blow to the latero-medial centre of the articulating surface. The vast majority of marks on cattle remains in this area were carried out with a cleaver. The atlas behind the skull showed chopping through the dorsal ends to remove the skull. Mandibles had been chopped through the diastema in front of the premolars and horizontally through the ascending ramus. Whereas horncores tended to be either chopped through the base of the horn or were removed from the skull by chopping through the parietal bone to keep the horn intact, probably for continued working.

Taxa	Aqueduct 108		Aqueduct 141		Overflow deposits n=12	
	NISP	%NISP	NISP	%NISP	NISP	%NISP
pig	27	6.0	14	11.0	114	10.3
cattle	90	19.9	33	25.9	184	16.6
sheep/goat	10	2.2	4	3.1	97	8.7
horse	24	5.3	1	0.8	18	1.6
dog	4	0.9	0		11	1.0
red deer	7	1.6	0		20	1.8
fallow deer	3	0.7	0		0	
red/fallow	2	0.4	0		0	
roe deer	4	0.9	0		4	0.4
bear	1	0.2	0		0	
badger	1	0.2	0		0	
human	5	1.1	0		0	
domestic fowl	1	0.2	3	2.4	4	0.4
bird	0		0		1	0.1
cow-size	107	23.6	20	15.8	227	20.4
sheep-size	33	7.3	30	23.6	221	19.9
unidentified	134	29.6	22	17.3	211	19.0
Total	**453**		**127**		**1112**	

Table 44; NISP taxa from the main features at Westward House, c. AD150-300.

Closer inspection of the individual contexts in the aqueduct area show further interesting characteristics. The fill of aqueduct 108 includes a greater range of species than the others, including some rare wild animals such as fallow deer, bear and badger, and five fragments of a human skull. One interpretation could be that the flow of water from different tributaries presumably washed material in from the northern area. The fill of eastern tributary was associated with primary butchery of cattle but not the rare species contained in 108. The northern tributaries cut through areas of earlier ritualised burials of possible high-status individuals. The inclusion of fallow deer foot bones and antler and well as small frequencies of domestic fowl are reminiscent of votive deposits in Britain and Europe of the Roman period (Sykes 2004; Philpott 1991, 201; Levitan 1993). Bear phalanges, representative of bear claws, are also a feature of high-status burials in northern Europe during the late pre-Roman Iron Age (Meniel 2002). If the early timber building was a shrine associated with high-status burial and votive deposition, then this may account for the somewhat anomalous material in the fill in the later Roman aqueduct 108.

However, rare species, in particular wild species were not found to be a feature of the late Iron Age/early Roman 'ritual' area. The evidence from the cattle remains suggest that this was an area designated for killing and dismembering livestock. The remains from the rarer mammals are suggestive of the remnants of skinning. The bear phalange, detailed in Chapter 3, included a cut mark on the dorsal surface of the bone. Fallow deer remains were represented by a metacarpal and a tibia. The metacarpal had been deliberately fractured, though there were no cut marks were observed on the fallow deer specimens. However, a metatarsal from a contemporary deposit at the Palace indicated several cut marks around the circumference of the proximal shaft indicating that skinning of fallow deer carcasses certainly took place. The badger was represented by a single mandible specimen. It may have been that whilst the processing of cattle was quite intensively practised here, the skinning of wild fauna was more specialised or did not take place as a year-round activity and so are recovered less frequently in fewer deposits. However, taken together the remains are more suggestive that this was an area where animals were taken to for initial processing and removal of the extremities, the skin, and presumably the visceral contents of the animals, and were being *made* into new artefacts with new properties to be taken back to the Palace or exported to local markets.

What is interesting, in spatial terms is that this area was at the front of the Palace and ran parallel with the road which connected Fishbourne with the urban centre at Chichester. The processing of these animals was not hidden away in a private section of the estate, and instead would have been experienced by anyone travelling to and from the Palace.

4.3.5 Summary discussion of Roman Landscapes of Dwelling

Past perspectives of Fishbourne have focused on the elite inhabitants and how they lived inside the Palace. It seems quite apparent that a great range of human-animal relationships existed at and around Fishbourne. These interactions were fundamental in the formation and maintenance of the local landscape in a number of different ways.

4.3.5.1 The Socio-Economic Impact of Pigs and Cattle on the Landscape

The early development of Fishbourne and its wider regional setting was as part of a local client territory (Cunliffe 1973, 26-29), one with certain political freedoms not afforded to other areas being interwoven into the Roman Empire as a result of the military conquest post-AD43. The high frequencies of pig at Fishbourne in the early Roman phase must, for now, remain tied to the context of late Iron Age aristocracies both in Britain and in Gaul where pigs were important as animals in long distance trade and exchange networks (Grant 2002), with pork consumption symbolising elite dining customs (King 1991, 16). The freedom to perpetuate high-status manners reflected the mores and development of the local political landscape and the region's relationship with its neighbours across the channel (see Millet 1990, 82-83). This much is seen, archaeologically, in the changing character of Fishbourne, Chichester and Hayling Island through the range of imported material culture and erection of civic buildings, Imperial inscriptions and statues during the early Roman period (Cunliffe 1973, 28; Down 1978, 139-157; Russell 2006, 106-113). The increased production and consumption of pigs fits with this social context and, indeed, the wider cultural landscape. King (1999, 189) highlights the impact of the *annona* (food requisitioning in the form of taxation) in Italy as causing the pork-rich dietary pattern of the elite groups observed in that province and suggests that economic acculturation led to similar patterns spreading out to other provinces, in particular, Britain and Gaul.

Whilst it is important not to place the rise in pig remains on elite sites within a monolithic Romanisation model, the patterns seen in the local context of the Fishbourne region suggest that this existed as a collection of changes which formed at this level. At the same time, the cross-channel context is also clearly a factor in such developments. Certainly, similar contemporary patterns in pig representation exist on sites in northern Gaul (Lepetz 1996, 122, 124). Ervynck *et al.* (2003, 429) note that for a foodstuff to be considered luxury it needs to be perceived as being beyond the level of affluence, or beyond food eaten in excess of basic and considered needs. For pork to be a luxury at early Roman Fishbourne it had to be considered as either 'goods that are *special*, limited in supply, difficult to procure or very expensive for other reasons' (*ibid.* my emphasis). The variation in patterns of pig bone deposition at Fishbourne and between different local sites suggest the multi-layered status these animals held in the area. The symbolic importance of pigs is more apparent at Hayling Island, and their cosmological importance in past societies is well known from other archaeological contexts (*cf.* Hamilakis and Konsolaki 2004).

A religious context surrounding pigs may well have added emphasis to their perception and 'specialness' as live animals. As well as their cosmological status, pigs also need to be fed, bred and reared; activities which are all likely to have taken place at Fishbourne. Columella includes lengthy instructions on the management of livestock on large farms for the mass production of food for the inhabitants and local urban centres (Gilhus 2006, 16). In terms of their economic output, pigs do not produce the variety of products which can be gained from cattle and sheep, a point which raises the financial costs of pig-rearing above other forms of livestock. For this reason, the ability to demonstrate pig-rearing on a large scale in pre-modern communities enhances the status of those involved (*cf.* Grant 2002). In isolation, the religious and economic roles of pigs may not be enough to lift pork consumption to the level of 'luxury'. However, by placing these together, within the context of the local political landscape of the Fishbourne region and the cultural affiliations of cross-channel contact, this could furnish pigs, their farming, and the consumption of pork with a more complex and nuanced social context.

The high frequencies of pig at Fishbourne demonstrate the social and economic importance of this animal. Because of this, the roles of sheep and cattle, which were also undoubtedly present in large numbers at the site, have been, perhaps unfairly, overlooked. It would be prudent here to link the changes to cattle husbandry noted in the ageing and metrical data (Chapters 3.6.2.2 and 3.6.5.2), the increasing frequency of cattle against pig from the early phase to the later ones (Chapter 3.6.1), and the social and experiential phenomena highlighted in this chapter. The status of the Fishbourne region as a client kingdom (*Regni*) has been argued to have ceased in the late 1st century AD (Cunliffe 1973, 28) and the political context may have been reflected in the redevelopment of the Palace into smaller 'villa habitations' in the early 2nd century AD (Russell 2006, 145-147). The shift from pigs to cattle, although an economic generalisation, also fits the socio-economic change at Fishbourne from an aristocratic imperial-affiliated landscape towards a high-status villa estate, possibly more concerned with animal production for financial gain rather than aesthetic enhancement.

In this sense, the reorientation and redevelopments of the Palace were not simply architectural and concerned with the buildings, but they imply an overhaul of the entire estate both physically and conceptually. There is certainly an abundance of evidence that the Fishbourne landscape developed into a highly structured and organised settlement concerned with the full range of livestock activities. The patterns of deposition of both zooarchaeological and zoo-related archaeological evidence attests to these in a spatial context: areas have been identified in relation to housing and herding, to places of slaughter and butchery at Westward House, towards final consumption at the central villa buildings. There is also a definite shift in emphasis from younger cattle being culled, an indication of a breeding dairy herd, toward an emphasis on older cattle in the later phases. This shift can be mirrored with the biometric data which indicates the increasing evidence for larger cattle in the later period, interpreted as a greater frequency of male bulls and castrates. A changing focus towards local arable agriculture is undeniable. When placed back into context with other local sites, most notably the Downland villa estates at Bignor, Chilgrove 2, and Batten Hanger, all of which include cattle-dominated assemblages (Chapter 3.6.1), Fishbourne moves more firmly along the trajectory of other rural settlements in its economic character and so, presumably, in the layout of its wider agricultural landscape. Of course once annexed into the Imperial setup, the area, its people, and its settlements became subject to Roman land tax and the *annona militaris*. The latter was a tax in kind where food was requisitioned for the military and which seems to have replaced an earlier system of purchase (Salway 1993, 448). Such a move would effectively drive villa estates to generate greater levels of production from their estates. Alongside increased frequencies of cattle, this suggests that greater areas of land were being turned over to arable agriculture, a move which would alter the aesthetic of the landscape to one based on cattle, fields of wheat, villas, roads and towns. This much can be discerned from the local landscape of the regional Fishbourne landscape, and the issue will be visited again in Chapter 7 in terms of 'Imperial Landscapes' on a wider provincial scale.

With economic change comes social change. Clearly cattle were regarded as symbols of prosperous landscapes in Mediterranean states during antiquity, and in many ancient societies were commonly related to 'harnessed power' and 'fertility' (Schwabe 1994, 41). Columella repeatedly stresses the successful co-operation of people and animals in agriculture (*De Re Rus.* 3, 6 and 7), so animals were seen as active participants in human relationships with nature and the maintenance of good farmland. Such actions, in this context, must have been symbolic of 'Roman' identity. The maintenance of the roads and trackways at Fishbourne would have felt the hoofs of these livestock as they were herded in and out each day. The recovery of animal bells east of the stream allow us to hear those animals as they travelled to and from their living quarters after days in the meadows and lush pastures which surround the watery landscape of Fishbourne. By integrating material artefacts with the faunal remains I believe I have been able to draw out the experience of herding animals (sounds of bells) and, through this, developed further ideas as to where on the settlement animals were being kept and managed when on site. Having those animals alive and in large numbers around the site would have been as, if not more, important than eating them everyday.

4.3.5.2 Animals and the Structure of Time and Memory

It seems clear that the settlement involved many people and animals moving in and out on a daily basis. Many of these identities have been lost over time, though the spatial analysis carried out here is beginning to shed some light on them once more, albeit a dim flash. Anthropological evidence commonly suggests that farms and settlements are structured along gender lines and the division of labour. Milking of livestock, for example, is generally carried out by younger members of the group or possibly either males or females, again socially dividing yet importantly structuring the group via labour (Reay 1984, 71; Sillitoe

2001, 188). Cato provides an interesting passage on the role of the manageress on the Roman farm: 'She must have cooked food ready for yourself and the household. She must have plenty of hens and eggs' (Cato *De Re Rus.* 143). In these words we, once more, see some of the movements and timings of specific people around the farm rather than *people* in general.

Signs of masculinity are, apparently, played out through horses, in their rearing or use in hunting practices. According to Cato (*ibid.*) the manageress must not perform rituals, so the horse burial at Fishbourne would have been an exclusively male act (if such practices entailed the same cultural rules as in Roman Italy), one which exercised their masculinity. The killing of young animals, as a yearly event, would have had quite a special significance and was probably carried out by an authority figure in the group. Killing is usually associated with masculinity, and the distribution of the carcass can be a ritualised form of distributing social order within the group (Symons 2002, 443). These activities are divided up into the many identities of the people who dwelt within the settlement. This chapter has gone a small way towards elucidating such complex matters.

The deliberate deposition of animals helped to develop the site, to form its local landscape. One aspect which has become apparent through analysis in this chapter is the generation of memory. This does not simply lie in the act of creating a monument, a landscape feature, but involves a range of activities which are played out beforehand and then finished with the construction of the monument to be re-experienced in future episodes. The actions carried out in anticipation of the main act are then, conceptually, deposited with the physical feature, and inscribed in the landscape for future experiences. Other features altered over time, such as the ditch in the northwest corner of the settlement or the horse-pit (before it became a 'horse pit') in the northeast of the settlement. These were earthworks which were open for many years, but which had animals and artefacts deposited within them, possibly on a regular basis. One could suggest that these interments were memorial in nature, simply because people knew they were there – those who had put them there and others who had experienced their creation. Because of the many people who inhabited Fishbourne these should be seen as collective memories, but ones which were made public or private to particular people by their position on the site and the persons' position within the community.

The creation of memory involves a range of opinions, the thoughts of those who control what is appropriate to remember or not (Said 2002). The horse pit is a good case study here as it represents an animal which was clearly important to the people who buried it. It was carefully dissected and buried with other animals (or parts of animals); those deemed appropriate to accompany it. Furthermore, these acts needed more than one person to complete the full range of tasks involved, and so their movements, their actions were also interred with the animal, again, inscribed in the landscape. Each act is representative of time and space in one form or another: long distance contacts and travel, death and the afterlife, or seasonal change.

Much has been made of the spatial layout of roundhouses in Iron Age Britain being reflective of cyclic time, dividing up conceptual dichotomies such as night/day, cold/warmth or darkness/light (Fitzpatrick 1997, 77-78; Oswald 1997; Giles and Parker Pearson 1999). The same principles are rarely afforded to 'Roman houses'. The rectangular buildings of the farmers and the elites in Roman Britain do not lend themselves to easily illustrated diagrams of cyclic time. Rather they are broken up into 'boxed' categories of social space (*cf.* Perring 2003). I hope to have shown however that the engagements between humans and animals at Fishbourne are, in fact, very attuned to cyclic annual time, and these are played out through numerous dichotomies such as indoors/outdoors, front/back, or watching/touching. The horse-related artefacts towards the front of the Palace, as well as the deer skulls and presence of wildfowl, suggests an association with 'riding out' into the surrounding estate and hunting. The evidence from the rear of the Palace at the kitchen garden is, instead, reflective of more sedentary activities: cooking, eating and spectating. The landscape is *drawn in* to the Palace and, at the same time, consumed both visually and orally.

4.3.5.3 Conclusion

As a high-status settlement on a virgin site, as far as we know, Fishbourne was developing in ways in which its inhabitants were aiming to mark it out as different to the local norm. The contexts of the faunal remains seem to reflect a place founded on power and trade. Feasting was part of this, though the evidence suggests that these were tied into a number of social acts taking place in other areas of the local landscape. Seeing a deposit as simply a 'death assemblage' means that they reflect only one event; but by placing them in a wider context they actually show indications of a broader passage of time. Hunting for wild animals, wildfowling and fishing must, on current evidence, be seen as rarely performed events in the local area. However, the lack of other evidence from the site during the Iron Age makes it very difficult to see whether these were simply 'special' acts or more reflective of everyday practices by the elite inhabitants of the site. What is clearer is that the site, from its earliest inception, was quite structured spatially. These events, feasting and burial, took place in different areas; different places as each reflected different acts within the landscape, both physically (farming, hunting) and cosmologically (birth, death). Here, landscape and time were intertwined. One aspect which seems to have been important is the use of sound in the human-animal-landscape relationships right from the earliest Roman periods. The finds of the possible wildfowler's decoy whistle and the animal bells suggest the ways in which people were experiencing and engaging animals in their environments was evolving.

This section has effectively used the same types of data examined in Chapter 3. However, by viewing this in a spatial dimension and paying much closer attention to the contextual backdrop we are now beginning to see the faunal remains in terms of the landscape at Fishbourne. It has a sense of place. Identity and landscape are produced together through actions in space and time. I broadly term this 'ritual', but it is equally applicable to the rhythms of the everyday as it is to the extraordinary. The people at Fishbourne, the women, children and men; the masters, servants, traders, artisans, herders, and hunters, each engaged daily with the settlement and its animal life continually reworking the pulse of linear and cyclic time on a single settlement. But, these had to have influenced, and been influenced by, animals, people and settlements elsewhere. The next chapter moves out from the micro-scale to examine the notion of regionality and the interlinked nature of animals and society on a wider scale.

Chapter 5: Regional Patterns in Human-Animal Practice

There has been an abundance of research which emphasises the regional distinctiveness of material culture and settlement patterns in Iron Age and Roman Britain and beyond (Hill 1999; Moore 2007; Pitts 2005; papers in Gwilt and Haselgrove 1997; papers in Haselgrove and Moore 2007). As a result, it is widely accepted that the existence of a socially-unified 'Iron Age' or 'Roman Britain' is false and that 'Celtic' and 'Roman' paradigms are modern constructions (Haselgrove *et al.* 2001; Hingley 2005). However, despite these developments, recent analyses which focus upon potential similarities and distinctions between regions has been limited to a few studies (see Hambleton 1999; Taylor 2007). Attempts at tracing the regional 'mosaic' of Britain is hampered by differences in the quantity and quality of data in different areas (Haselgrove *et al.* 2001, 12-13). Furthermore, the legacy of culture-historic and processual approaches has left a stigma upon the study of inter-regional distributions in archaeological material. Comparing data distributions has a tendency for placing material culture in a fixed one-to-one relationship with ethnic groups; a method of enquiry which was clearly popular for most of the 20th century (Childe 1940; 1933; Cunliffe 1991; Elston *et al.* 1982; Renfrew 1972; Staski 1987, 53-4). However, such approaches have been widely critiqued within Iron Age and Roman archaeology (see Millett 1990; Barrett 1997; Mattingley 1997; Creighton 2001; Hill 2007) because correlations between cultural patterns and ethnic groups are rarely shown to be consistent (Hodder 1982; Jones 1997). Consequently, the development of these theoretical concepts has left a tension in current analytical methodologies: the characterising of regional variation in order to demonstrate cultural differences within a geographic area, coupled with the move away from identifying fixed cultural traits from archaeological typologies.

As mentioned, there have been attempts at synthesising the large quantity of data at our disposal on a regional format. For instance, Taylor's (2007) extensive survey of Roman rural settlement in England used eight broad districts to separate the data. The boundaries used were not based on any previous archaeological research but instead were taken directly from the administrative areas used by English Heritage as a 'convenient way of structuring the overview' (Taylor 2007, 39, 55). Although regional variation in the archaeological record can be recognised through this methodology, it is impossible to attribute these to any form of regional identity in the past since the areas and boundaries have been imposed from the present.

In contrast, Hambleton's (1999) analysis of Iron Age zooarchaeology employed geographic areas based upon shared ceramic distributions and environmental characteristics (Hambleton

1999, 14-15; after Cunliffe 1991). Whilst it could be argued that there is greater merit in an approach which arranges the data by placing it in a pre-existing context, theoretically this continues to promote the validity of material culture/ethnic identity correlations. Secondly, the method presumes that simply overlaying faunal remains data upon delineated distributions of pottery typologies represents something meaningful about past communities beyond the basic premise that this was merely where 'things' were buried. If different classes of material are not sufficiently articulated within the analysis we may miss alternative patterns of daily practice which bear little relation to the boundaries drawn prior to analysis taking place. At this point it must be stated that Hambleton never suggested that regional identities were apparent through her examination of the data, rather she demonstrated that farming practices in Iron Age Britain varied across the country. She, quite rightly in this case, focused her analysis solely on animal husbandry regimes and was able to construct a series of economic models for each proposed region (1999, 87-93). The regional variation demonstrated by Hambleton cannot be taken as evidence for cultural differences in farming practice, as the boundaries are constructs imposed by archaeologists (*cf.* Jones 1997, 108-110), and takes no account for overlapping movement of people and animals at different scales (Tilley 1994, 17-18).

Perhaps the greatest problem with most traditional studies of spatial variation is that they generally involve a 'top-down' analysis of data (*cf.* Taylor 2007). These approaches take predefined 'areas' as representative of regions, convenient spaces within which to examine archaeological evidence. However, regardless of scale, these 'areas' place little emphasis on the spaces and boundaries which might have been in position in the past. Furthermore, spaces and boundaries are meaningless without considering the actions which take place within them. Couched within methodologies is the problem of defining what actually constitutes a *region*. Anthropological study has shown that meaningful spaces are culturally created on both micro and macro dimensions through the organisation of individual, family, and village life combined with the rhythms of time (Helms 1988, 20). How then do we, as archaeologists, define areas which existed in the past; ones which were meaningful for the people who inhabited them?

Rather than forcing regional identities upon a landscape through the imposition of boundaries which may or may not have existed in the past, I aim to view the evidence for localisation. Archaeologists cannot create regional identity; it was created by the people who dwelt within those landscapes. My approach advocates the view held by Haselgrove (1989, 46) who has argued that '[identity is] the aggregate of processes operating essentially at a local level, people by people. Even within a single province, the form and degree of change varied between different groups and regions'. In this manner the interpretation can transcend different scales of activity (*cf.* Tilley 1994, 17-19). There are implications for the variety of ways animals were exploited in different places. This much seems to have been evident from the historical literature such as Pliny's (*Hist. Nat.* 8.73) statement that sheep are not shorn everywhere but rather in some places the traditional practice of plucking wool still endures. Clearly such a practice would be impossible to draw from zooarchaeological evidence though the passage does show the inherent differences in farming practice which took place within different areas.

Hambleton (1999, 87) has alluded to the possibility of intra-regional differences in animal husbandry regimes. If such differences were apparent this has important connotations for our understanding of localised social practice and expressed identity. People who live with livestock move and act based upon the layout of their immediate landscapes because of the need to exploit resources; and the resources they most commonly use are likely to be situated in close proximity to the herd. For example, by inhabiting a particular river valley the use of waterways and surrounding pasture in the local vicinity for their animals is preferable to travelling several miles to reach the neighbouring valley (Mainland 2008, 547). It must be remembered here that the landscape would have been embedded with the specific cultural meanings of those communities engaging with them, which influences and directs their actions (Tilley 1994, 202).

If, as Tilley (1994, 18) argues, 'Place is about situatedness in relation to identity and action', then farming and moving with livestock may serve to create boundaries, marking out social distinctions, in tandem with the natural features of the landscape, the hillsides, rivers and woodlands, but also generating cultural meaning upon them. With this in mind, one could argue that sites that are situated within localised environments are connected by the fact that their inhabitants are moving through, and engaging with, the same environment, in turn creating a communal or shared perception of landscape (*cf.* Lorimer 2006). Of course, locales (i.e. those spaces or areas of movement specific to different people) do overlap through longer-distance trade and other inter-regional connections, and these actions serve to conceptualise space on different levels.

My approach aims to bridge the gap between these two perspectives by combining the use of GIS positioning of quantified bone data, ageing profiles from domesticates and evidence from social anthropology. The method looks to visualise landscape through farming practices by adding dimensions (space and time) to it in two ways. The first step is to plot faunal quantification data on topographic maps which allows us to treat sites, not as uniform data points, but, in a spatial format which links social practices to an environmental background. This technique resonates with the methods of Eric Higgs who developed Site Catchment Analysis (SCA) in the 1960s and 1970s (Higgs and Vita-Finzi 1972; see also Jarman 1972). Higgs argued that environments could be exploited from a particular site and that the archaeological remains directly reflected the potential of the land and with decreasing intensification as people move away from the settlement. As a framework, this theory gained some success within zooarchaeological studies (*cf.* Robertshaw and Collett 1983; and for a GIS application see Byerly *et al.* 2005). However, the approach has since been largely critiqued from the point of view that people rarely use the surrounding landscape to its full potential in an economic sense (Evans 2003, 4). Such a model does not consider the deliberate avoidance of particular environmental resources, or acts of deposition in areas towards the peripheries of inhabited spaces signifying their importance as places of cultural meaning and activity (Bradley 2000, 150-153; Fitzpatrick 1984; Hunter 1997).

The nature of SCA invokes the largely discredited notion of environmental determinism, whereby cultural practices are simply responses to natural environmental conditions (Wylie 2007, 10). And yet we consistently hear echoes of determinism within the zooarchaeological literature. We are often reminded of generalisations such as 'cattle regularly need water' so this indicates the presence of a local water source (Mainland 2008, 547), or about the absence of woodland being a barrier to the successful rearing of pigs (Church *et al.* 2005). Such statements have been a major reason why the more theoretically-informed zooarchaeological studies have kept away from placing zooarchaeological data within an environmental context, i.e. many syntheses simply place dots on blank backgrounds (e.g. Sykes 2004). Yet this, ironically I would argue, draws us back to methodologies set within a processual modelling-type framework, and consequentially removes an important dimension from our analyses. The physical environment plays an essential part in the production of culture because it gives landscape texture (see papers in Adams *et al.* 2001). We simply must remember that human and animal lives are not orientated in a unidirectional manner as is attested by SCA; the exploitative-potential of landscape does not continuously diminish in a linear fashion moving away from settlements because *all* of the landscape is, and was, lived in. Within this theoretical framework we remove the problem of environmental determinism. Therefore, if we (re)integrate zooarchaeological data with a spatial/topographic context we are re-engaging humans and animals with the landscape. However, this is still only the first step.

The second step is to introduce a sense of time, vital for observing a 'humanised' landscape (Gosden 1994, 188-196; Ingold 2000, 189-208), or from my perspective an 'animalised' landscape (focusing on both humans and animals). Incorporating ageing data from livestock remains adds a temporal dimension to the evidence, one which lifts the archaeology from its final resting place back towards the social practices which took place when the animals were alive. The production of human/animal cultures takes time; it is a performance through which identity is constructed (Ivarsdotter 2004). This should always remind us that animal husbandry is not simply an economic venture which provides people with basic (nutritional) sustenance, but also emotional and mnemonic sustenance. People who farmed sheep in the past did so by continuously dwelling with those animals. The lengths of time this took, and indeed how time might have been structured for people in the past, can be evidenced through ageing data. The interactions between people and animals influenced how they moved through the landscape, how labour was divided within communities, and how they came to identify themselves (Dahl and Hjort 1976; Ingold 2000, 72; Mlekuz 2003). Attitudes toward animals in modern pastoral societies, for example, have been shown to relate to attitudes toward other humans, most notably between neighbouring ethnic groups with whom they may be in conflict (Abbink 2003). Importantly, it is the carrying out of daily practices between people and animals and other people which creates social identity.

To place the evidence within a geographic context I have allocated two areas. Neither are bounded by any modern or archaeological context; but it must be considered that the sites *within* each are likely to have interacted with, and been influenced by, factors *outside* the designated vicinities. I am not proposing these to be 'regions' which are comparable to each other, rather these are simply spaces where a great deal of farming activity took place in the Iron Age and Roman period. The areas have been chosen, not because they represent any preconceived idea of regionality but because they have been extensively excavated, producing a large number of animal bone assemblages which are generally well preserved, and so that the sites can be viewed at an appropriate scale (Figure 149). The geographic coverage of Area 1 includes part of the South Downs, the southern edge of the Thames Valley, and a *c*.60 mile stretch of the south coast (Figure 150). Area 2 consists of the Upper Thames Valley and the Severn Valley which are dissected by the Cotswolds (Figure 151).

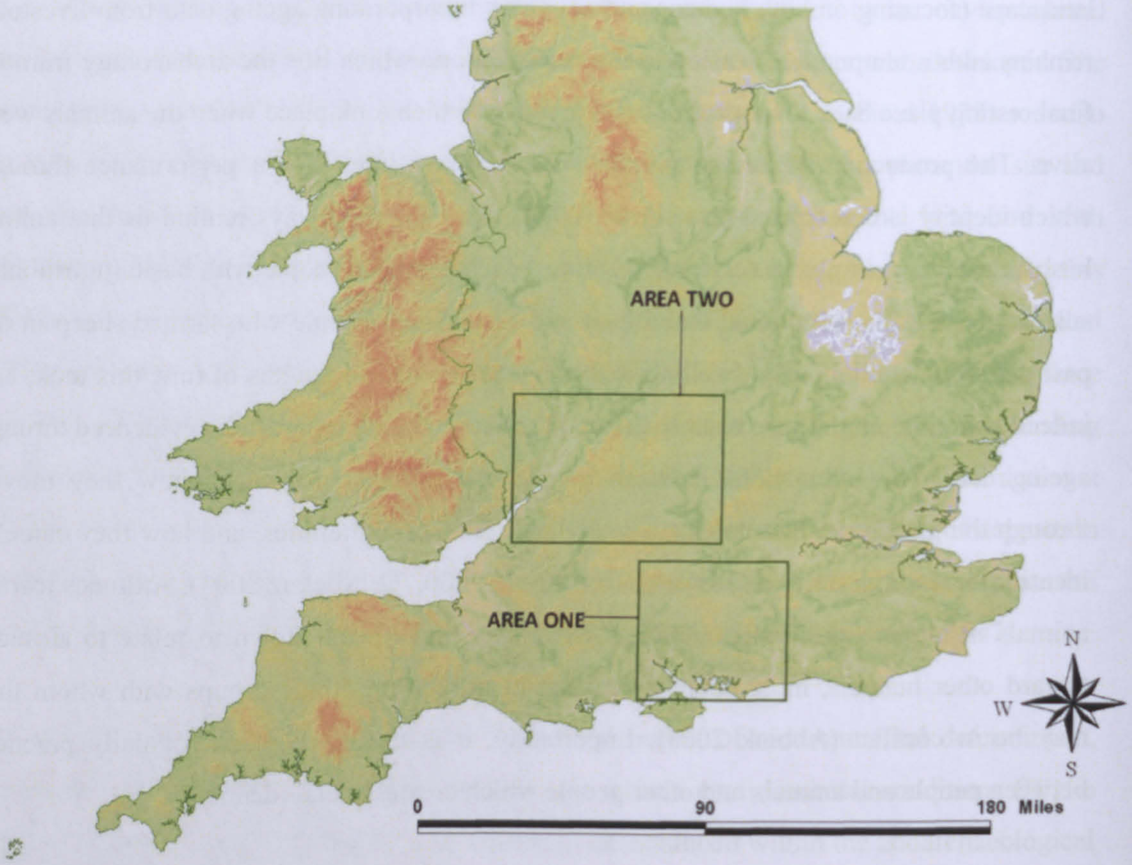
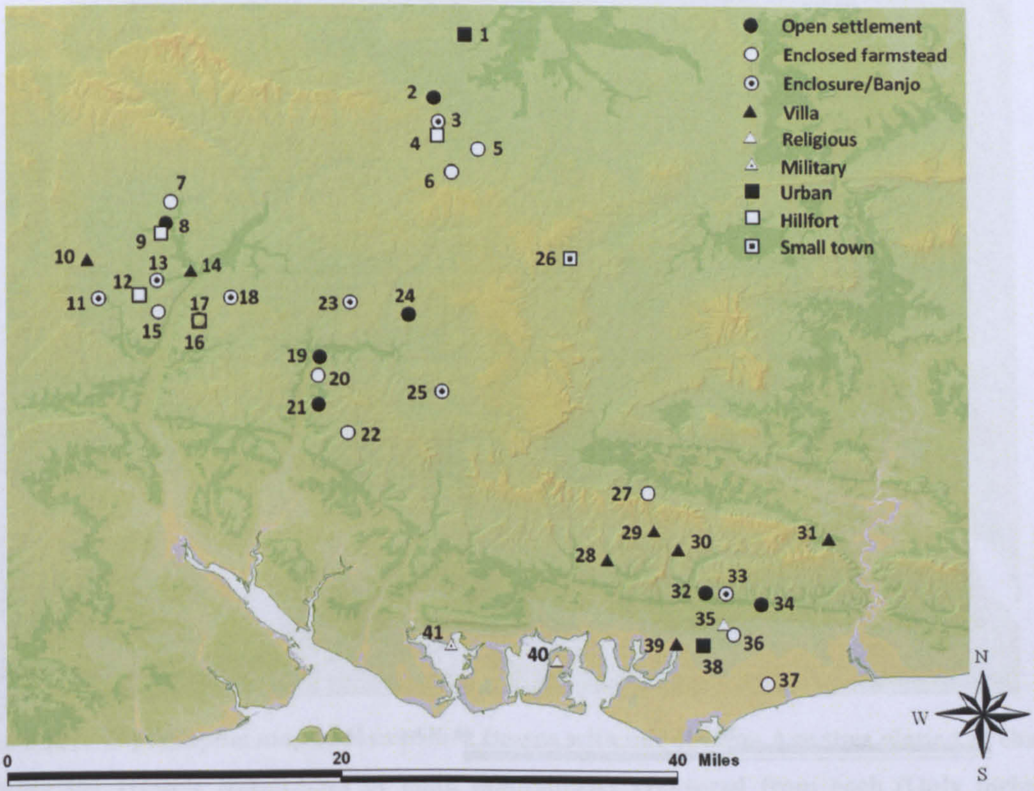


Figure 149; Position of Areas One and Two within Britain



1	Silchester	11	Suddern Farm	21	Twyford Down	31	Bignor
2	Monk Sherborne	12	Danebury	22	Owslebury	32	Lavant
3	Rooksdown	13	Nettlebank Copse	23	Micheldever Wood	33	Carne's Seat
4	Winklebury Camp	14	Fullerton	24	Abbotstone Down	34	Ounces Barn
5	Rucstalls	15	Houghton Down	25	Bramdean	35	Westhampnett
6	Brighton Hill	16	Woolbury	26	Neatham	36	Copse Farm
7	Old Down Farm	17	Little Somborne	27	Elstead	37	North Bersted
8	Balksbury Camp	18	Chilbolton Down	28	Watergate	38	Chichester
9	Bury Hill	19	Easton Lane	29	Batten Hanger	39	Fishbourne Palace
10	Grately South	20	Winnall Down	30	Chilgrove 2	40	Hayling Island
						41	Portchester

Figure 150; Distribution of Iron Age and Roman sites across Area 1; includes Hampshire/West Sussex downland, valleys and coastal plain

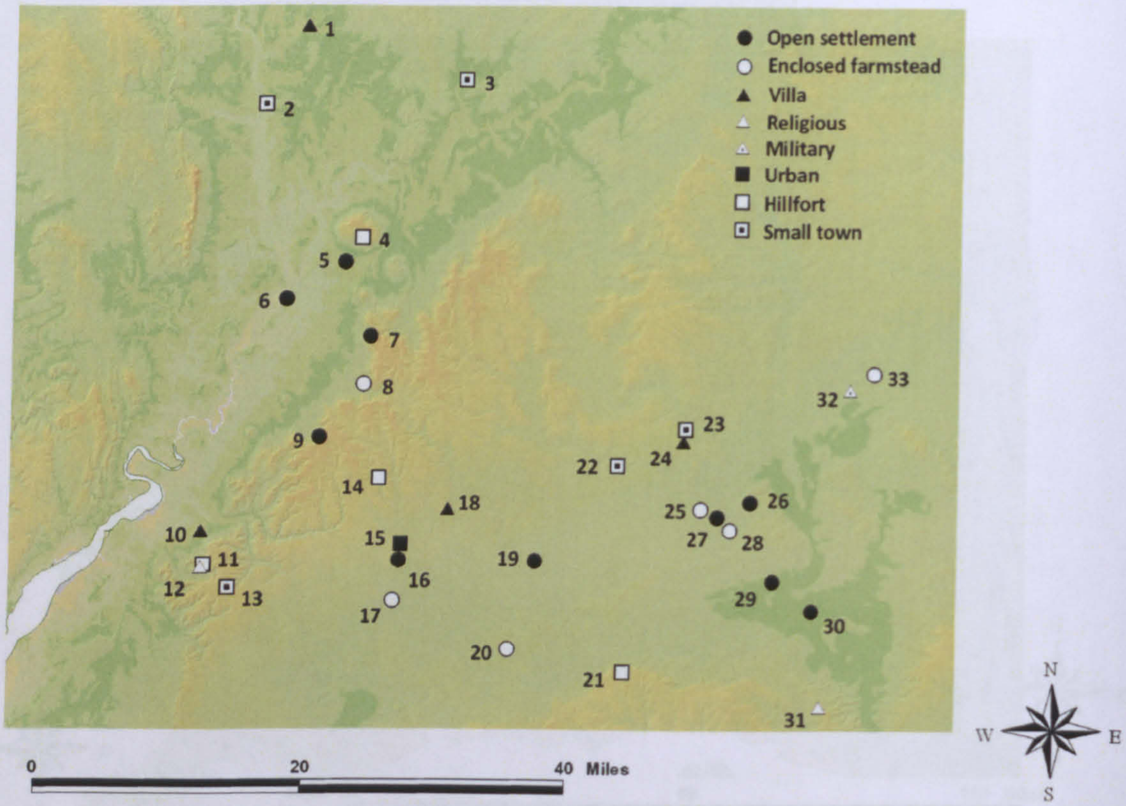


Figure 151; Distribution of Iron Age and Roman sites across Area 2; includes part of the Upper Thames and Severn Valleys and the Cotwolds

1	Droitwich	9	Birdlip	17	Neigh Bridge	25	Mingies Ditch
2	Worcester, Sidbury	10	Frocester	18	Barnsley Park	26	Farmoor
3	Alcester	11	Uley Bury	19	Claydon Pike	27	Gravelly Guy
4	Conderton Camp	12	Uley Shrines	20	Groundwell Farm	28	Watkins Farm
5	Aston Mill Farm	13	Kingscote	21	Uffington White Horse	29	Ashville Trading Estate
6	Tewkesbury	14	Ditches	22	Asthall	30	Appleford
7	Haymes	15	Cirencester (Maltby)	23	Wilcote	31	Lowbury Hill
8	Charlton Kings	16	Spratsgate Lane	24	Shakenoak	32	Alchester
						33	Bicester Fields Farm

5.1 Regional Patterns in Livestock Frequencies

5.1.1 Iron Age: Area 1

There is a paucity of remains from middle Iron Age sites which reflects the lack of excavation on sites of this date in the local Fishbourne region. On the Hampshire downs to the north and west of the Fishbourne, however, there are a number of Middle Iron Age sites (Figure 152). These sites appear to cluster spatially into three groups, each gathering around the main river valleys of the downs: the Test Valley, the Itchen Valley and the North Hampshire Downs. All of the assemblages in this area demonstrate high sheep/goat percentages but, subtle patterns emerge when the data are considered spatially.

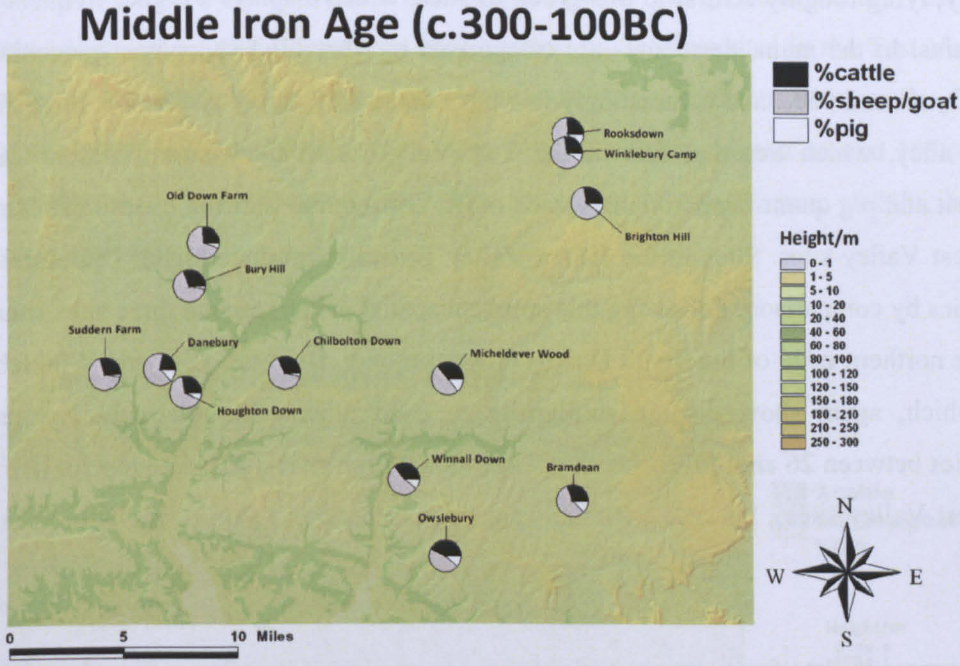


Figure 152; Topographic map of Hampshire Downs with middle Iron Age sites plotted as charts showing the relative frequencies of main domesticates recovered from each (Only includes assemblages with >100NISP from cattle, sheep/goat and pig).

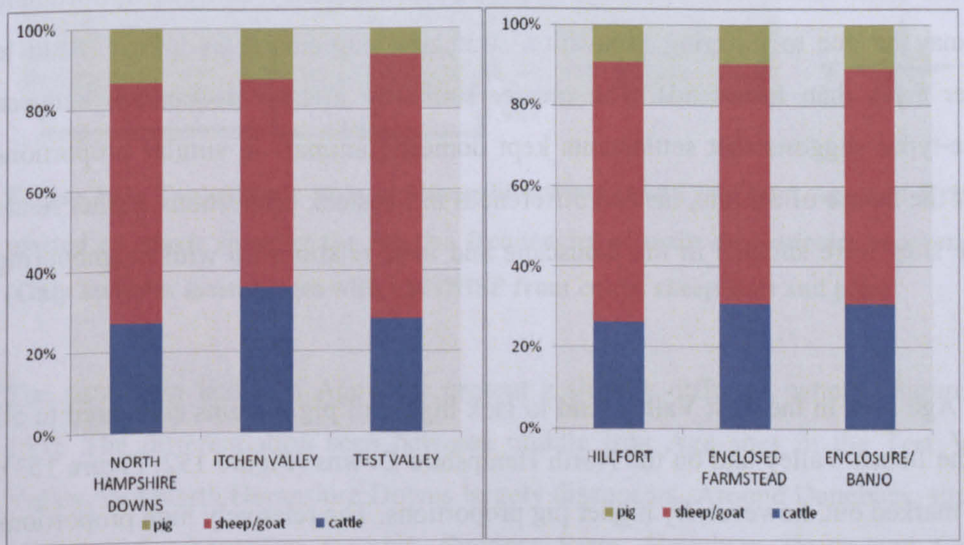


Figure 153; Left - Relative frequencies of main domesticates from localised parts of Area 1 of middle Iron Age date; Right - Relative frequencies of main domesticates displayed by site type. Both data sets are calculated as the mean of the total NISP percentages from each site. Includes sites which produced a total fragment count from cattle, sheep/goat and pig of 100+ (for number of sites refer to Appendix A).

Sites which are situated within the Test Valley i.e. those from Suddern Farm to, and including, Chilbolton Down, produced similar frequencies of main domesticates when compared to each other. The anomaly amongst these data is shown by the hillfort at Danebury, lying roughly central to this group of sites, which displays a higher frequency of pig remains. In the main, these sites are categorised by very high sheep/goat percentages, commonly around 65%, and contrastingly low pig frequencies, rarely above 5%. Sites in the Itchen Valley, which lies due east of the Test Valley, also show similarities in cattle, sheep/goat and pig quantification data to each other, but seem to indicate overall differences to the Test Valley sites. Sites in the Itchen Valley generally produce higher cattle and pig frequencies by comparison. Following this apparent spatial pattern are the three sites situated along the northern edge of the South Downs at Rooksdown, Brighton Hill, and Winklebury Camp which, again show distinct similarities to each other with relatively low cattle frequencies between 26 and 28% on each site, generally high sheep/goat frequencies (similar to the Test Valley sites), but also with high pig frequencies more akin to the Itchen Valley sites.

The differences in data from sites in each of these 'areas of habitation' are shown in Figure 153. As each area includes sites differing in typology, the same data are also shown here from hillforts, enclosed farmsteads, and other enclosures. When the data are divided by site type the mean frequencies show only minor variations, particularly between enclosed farmsteads and other enclosures. The small difference in frequency between hillforts and other sites may be due to differing excavation strategies, particularly as hillforts tend to cover greater areas than farmsteads. The greater similarity in taxa frequencies between differing site-types suggests that settlements kept domestic animals in similar proportions regardless of the nature of the site, instead differences in livestock proportions further relate to where the sites were situated in the landscape and their relationship with neighbouring settlements.

Middle Iron Age sites in the Test Valley tend to lack higher of pig remains compared to all the sites in the Itchen Valley and on the North Hampshire Downs (Figure 152; Figure 153). Danebury is marked out, however, by higher pig proportions. The relatively high proportions of pig remains recovered from each site in the Itchen Valley cannot suggest differential status as they include comparatively equal pig frequencies to each other. Sites of similar type in different areas were not always represented by similar taxa quantifications. Pigs are comparatively well represented at the Banjo enclosures at Rooksdown (North Hants Downs) and Micheldever Wood and Bramdean (both Itchen Valley) but are lacking from the Banjo at Chilbolton Down and the ditched enclosure at Suddern Farm (both Test Valley). Whilst these sites are similarly categorised archaeologically as 'animal management centres' (*cf.* Hamilton 2000, 188) the social practices taking place at each may have been more specific to local circumstances rather than the layout of each site. Sites in the North Hampshire Downs sites exhibited cattle frequencies lower than the Itchen Valley, closer to the Test Valley by mean value, but a mean frequency of pig remains higher than sites in the Test Valley, more similar to the Itchen Valley sites. There is a discrepancy, however, between the frequencies from Brighton Hill and Winklebury Camp, both of which produced around 10%, compared to Rooksdown which produced the highest frequency of pig remains, at 21%, between all sites in each area.

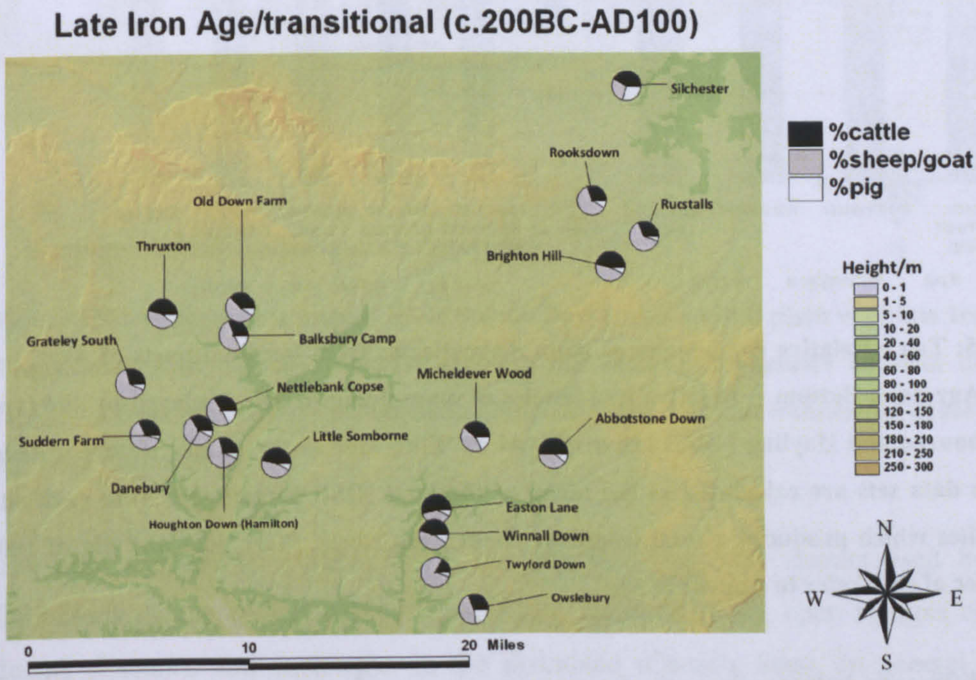


Figure 154; Topographic map of Hampshire Downs with late Iron Age and Transitional sites plotted as charts showing the relative frequencies of main domesticates recovered from each. (Only includes assemblages with >100NISP from cattle, sheep/goat and pigs).

The data from late Iron Age sites present a slightly different pattern (Figure 154; Figure 155). The differentiation seen between middle Iron Age sites in the Test Valley, Itchen Valley, and North Hampshire Downs largely disappears. Around Danebury, sites continue to exhibit high sheep/goat remains. Suddern Farm, Houghton Down and Grateley South indicate relative frequencies more akin to the middle Iron Age pattern. Frequencies of main domesticates indicate a greater variation between sites within the valley which may have mirrored changes in settlement dynamics. At the enclosed farmsteads of Little Somborne and Thruxton, cattle remains were excavated in greater quantities than sheep/goat albeit only marginally. The differences in mean livestock frequencies between different site-types are also minimal overall. Either there was a greater degree of variation in local farming practice in each area, or a greater homogeneity developed across the wider area. The variations displayed though the spatial distribution of the data in Figure 155 suggests that the former is more likely.

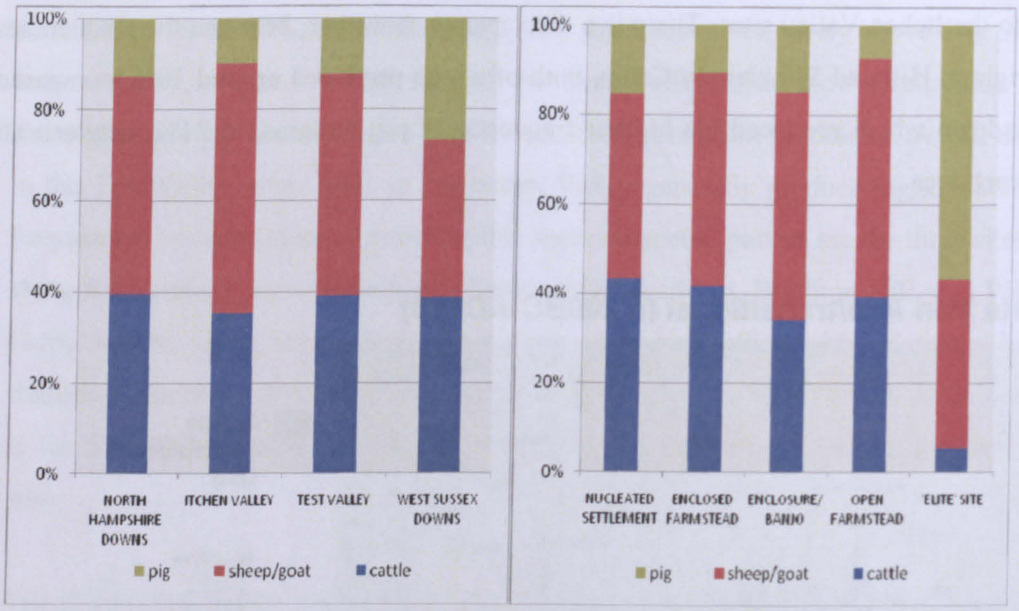


Figure 155; Top - Relative frequencies of main domesticates from localised parts of Area 1 of late Iron Age date; Bottom - Relative frequencies of main domesticates displayed by site type, N.B. Fishbourne and Hayling Island are displayed as 'Elite' due to the unique nature of these sites. Both data sets are calculated as the mean of the total NISP percentages from each site. Includes sites which produced a total fragment count from cattle, sheep/goat and pig of 100+ (for number of sites refer to Appendix A).

A small difference between low pig frequencies on open farmsteads compared to higher values recovered from enclosed sites (hillforts, banjos, and enclosed farmsteads) may indicate a relationship between enclosure and pig-keeping. Relatively high frequencies of pig remains were excavated at Balksbury Camp, an open nucleated settlement but which is situated with a larger hillfort (Cunliffe 2000, 170), Nettlebank Copse, Micheldever Wood (both banjo enclosures), and Owslebury (an enclosed farmstead). None of these sites indicate any overtly high-status associations and instead these seem to have settlements where pig management was more important to local groups. Hamilton (2000, 71) has suggested that Nettlebank Copse and Balksbury Camp fulfilled clientship obligations by becoming places where exchange networks had realigned. As these two sites are situated either side of the River Anna they, perhaps, satisfied localised management of pigs for the wider area. Nettlebank Copse, in particular, showed no evidence of buildings within the enclosure, but the plan of the site suggests it was particularly suited to the corralling of animals (Hamilton 2000, 188).

Late Iron Age/transitional (c.200BC-AD100)

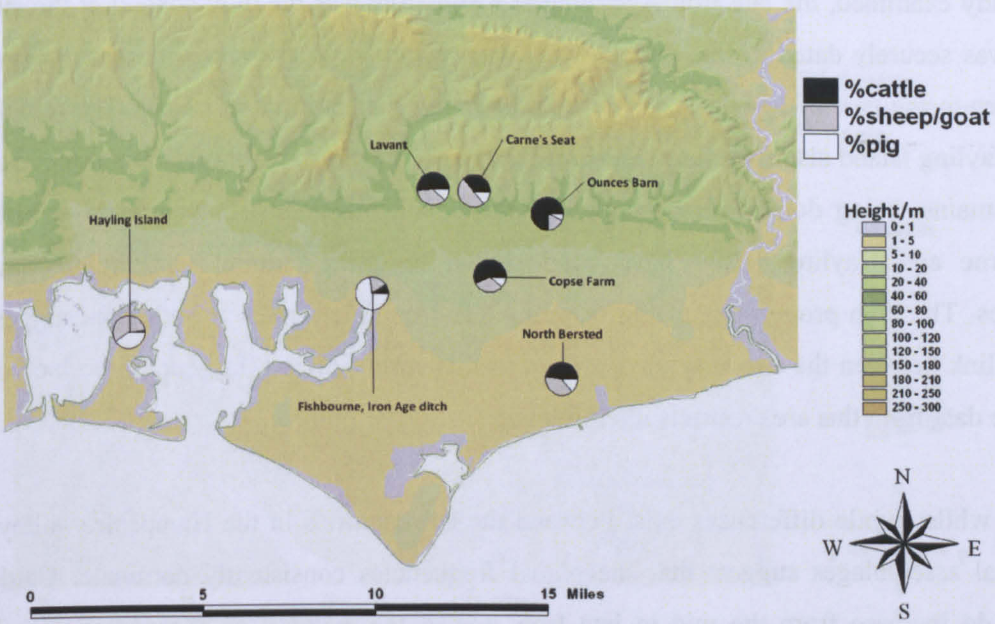


Figure 156; Topographic map of West Sussex Downs and coastal plain with late Iron Age and Transitional sites plotted as charts showing the relative frequencies of main domesticates recovered from each (where sites include both a late Iron Age and transitional phase the former has been displayed here)

The area surrounding Fishbourne in the late Iron Age was characterised by enclosed farmsteads on the coastal plain (Copse Farm, North Bersted), open villages close to the downs (Lavant), and enclosures in the downland (Carne's Seat). In general the faunal remains from the area during this period are poor in quantity and quality. Only a few sites of late Iron Age/transitional date provide suitable faunal remains. The enclosure at Carne's Seat included an extensive multiple ditch system, which was only sample excavated by trial trenches (Holgate 1986). Despite the small quantity of remains recovered the frequency of domesticated animals suggests that sheep were the most common animal at the site (Figure 156). The village site at Lavant produced minimal remains from the settlement despite a large area being excavated (this site is currently unpublished). Small quantities of bone of varying preservation were recovered from shallow pits within the settlement. At best we can either conclude that animal bone was cleared from the site and deposited elsewhere or that animals simply were not slaughtered and eaten in any significant quantity. The farmstead at North Bersted is situated on sand geology, which severely affected the preservation of the remains (King and Bedwin 1978). It seems, however, that the identified sample from North Bersted was similar to that at the nearby farmstead at Copse Farm which produced faunal remains with a higher level of preservation, though with a higher proportion of sheep/goat to cattle (Figure 156).

As already examined, the late Iron Age ditch at Fishbourne was the only context at the site which was securely dated to this period. This assemblage is clearly very different to those from sites to the east of Fishbourne with a remarkably high proportion of pig. The temple site at Hayling Island also represents a clear difference to the norm with a relative absence of cattle remains, being dominated by both sheep/goat and pig bones. Later phases at both Fishbourne and Hayling Island have been shown to share cultural and architectural properties. The high proportions of pig from the late Iron Age phases at both sites suggest that the link between the two may have started in this earlier period. In general the lack of Iron Age data from this area restricts interpretation.

Overall, whilst subtle differences exist between the communities in the Hampshire valleys the faunal assemblages suggest that sheep/goat frequencies consistently dominate. Cattle remains do increase from the mid to late Iron Age at the expense of sheep/goat though remain less frequent by comparison overall. These clusters of sites are different to the sites on the West Sussex Downs and the coastal plain. Whilst the data from these sites is less reliable, the overall pattern suggests that cattle were generally more frequent. The sample from Carne's Seat, whilst small, included a higher quantity of sheep/goat remains, indicating that there may have been a separation in stock-raising practices between the South Downs and the coastal plain. The presence of unusually high pig frequencies at Fishbourne and Hayling Island (pig/caprine in the latter) also indicates that livestock were exploited in a different fashion where elite groups were concerned.

5.1.2 Roman period: Area 1

Across the Iron Age/Romano-British transition, it appears that settlements in the Test Valley continued to exhibit high sheep/goat frequencies compared to sites in other areas, where cattle and pig are generally better represented (Figure 157). This correlation between high sheep/goat percentages on sites in the valley continues despite local economic development with the two 'high-status' villas at Fullerton and Grateley South show increased sheep/goat percentages. Of all the 'villa/farmstead' sites in Area 1, the four highest proportions of cattle each come from sites not situated in the Test Valley. The quantification data generally suggest that similar proportions of animals are better correlated between sites within specific landscape locales than they are with sites situated elsewhere of similar type or socio-economic status.

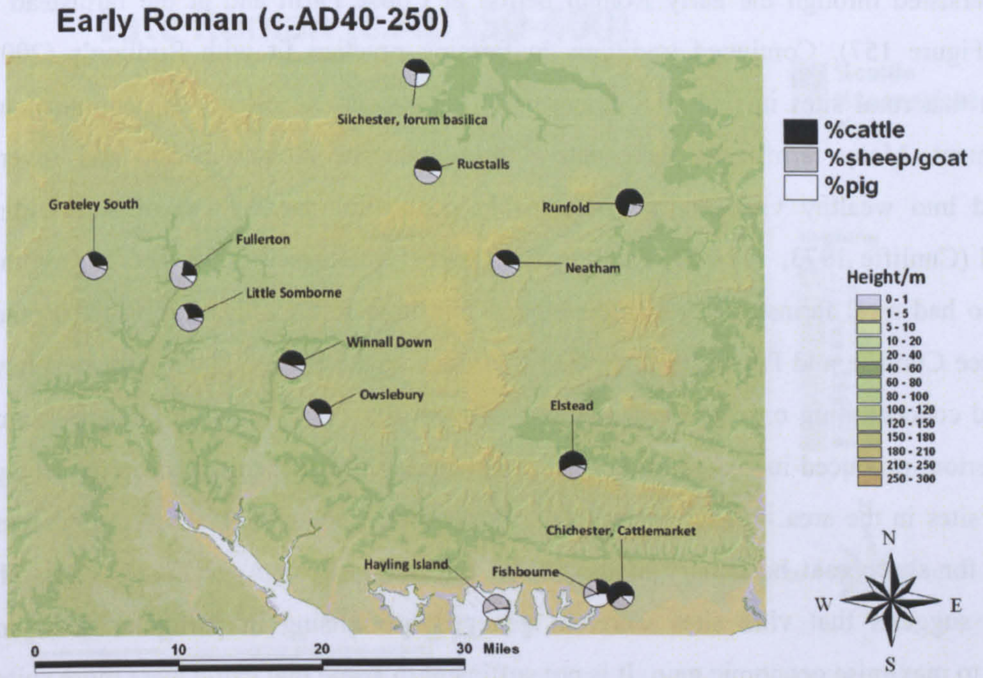


Figure 157; Topographic map of South Downs and coastal plain with Early Roman sites plotted as charts showing the relative frequencies of main domesticates recovered from each – only includes sites which produced a total fragment count from cattle, sheep/goat and pig of 300+

A good example of this is also indicated by sites on the West Sussex downland and coastal plain in the later Roman period (Figure 158). The bone assemblages from sites in this area are all clearly cattle-dominated (Figure 159). The rural farms and villas of the Downs exhibit relative frequencies of cattle bone at 60% or higher. If the Iron Age assemblage from Carne's Seat indicated that sheep were a feature of the South Downs pasturage this has clearly shifted to cattle at least by the 3rd century AD if not earlier. This would suggest that cattle-ranching became a feature of the South Downs. Data from the high-status settlement at Fishbourne indicates a shift from pig to cattle from the early to late Roman period. This change may indicate altering social and economic circumstances at Fishbourne from the earlier aristocratic centre to a site closer akin to the villas in the Downs. High cattle frequencies are also present in the urban assemblages excavated from the Cattlemarket and Lavant Culvert sites situated outside the east and south walls of late Roman Chichester. From an economic perspective it seems that rural farms were taking advantage of the demand for cattle, probably for meat, skins and other raw materials. These patterns, however, are not simply an economic response to urban development.

The concentration on cattle farming in this area continues from the late Iron Age when the farmsteads at Copse Farm and North Bersted began to concentrate on cattle farming within large ditched enclosures, as shown earlier. This area shows a tradition of cattle farming which persisted through the early Roman period at Copse Farm and at the farmstead at Elsted (Figure 157). Continued traditions in farming practice fit with Rudling's (2003) assertion that rural sites in this area demonstrate a considerable degree of continuity and development. Many farmsteads were active throughout the Roman period and several expanded into wealthy villa estates, presumably controlling large areas of surrounding farmland (Cunliffe 1973, 102-103; Rudling 2003, 115-122; Russell 2006, 166-191). Other areas also had rural farmsteads which developed into high-status villas during the Roman period (see Cunliffe and Poole 2008). Whilst the villas of the Sussex Downs seem to have continued concentrating on cattle exploitation, villas in the Test Valley, at Grateley South and Fullerton, produced increased sheep/goat frequencies, higher than the mean percentage for rural sites in the area. This is perhaps significant for an area which shows a consistent tradition for sheep/goat husbandry at least from the middle Iron Age (Figure 152). The evidence suggests that villa sites were, in general, specialising in particular taxa, and probably to maximise economic gain. It is not sufficient to argue that cattle were more suited to particular environments than sheep and vice versa as the areas covered by these sites include the same types of natural resources as each other. Cattle farms on the Sussex Downland were no closer to water sources than those in around the Test Valley. However, the animals which were chosen as livestock at villas seem to have been those which formed traditional bases of farming lifestyles in each area. The decision to concentrate on sheep or cattle seems to have been tied up with localised social histories and it these traditions which were intimately linked into local economic systems.

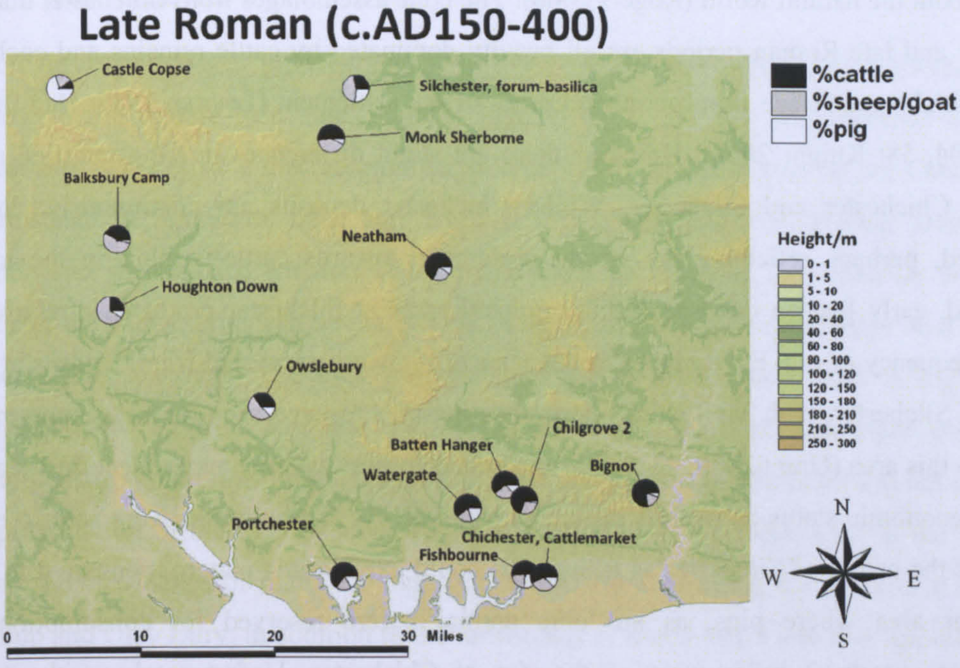


Figure 158; Topographic map of South Downs and coastal plain with Late Roman sites plotted as charts showing the relative frequencies of main domesticates recovered from each – only includes sites which produced a total fragment count from cattle, sheep/goat and pig of 300+

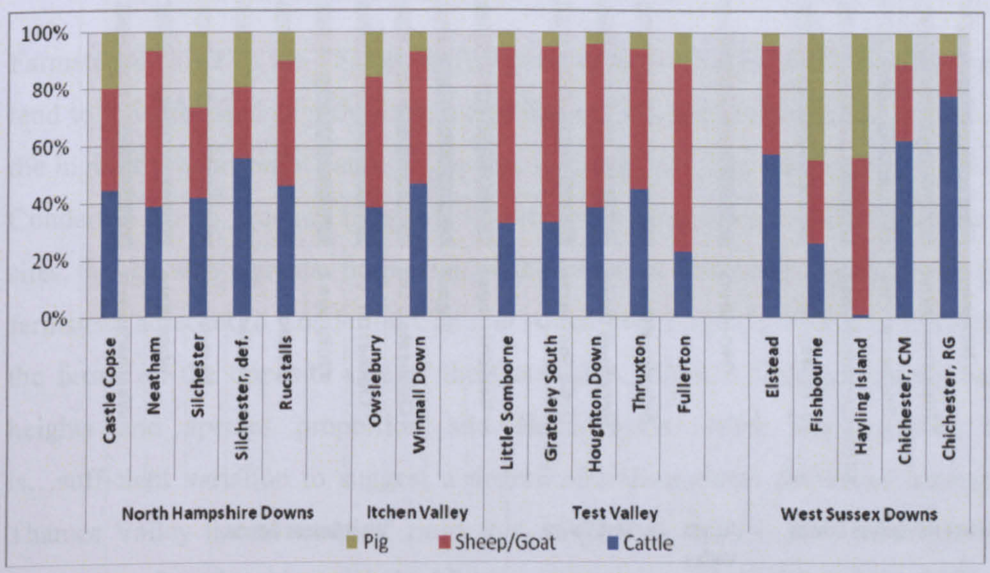


Figure 159; Relative frequencies of main domesticates from sites divided by localised parts of Area 1 of Early Roman date. Calculated as the mean of the total NISP percentages from each site. Includes sites which produced a total fragment count from cattle, sheep/goat and pig of 100+ (for sample sizes refer to Appendix A).

The development of urban settlement would have affected, and been affected by, the nature of rural settlement in different ways. The towns themselves have been shown not to be uniform entities but individual places growing through the influences of local customs and beliefs about the natural world (Rogers 2008). The bone assemblages from Chichester during the early and late Roman periods are all heavily dominated by cattle remains and each of these assemblages derive from peripheral areas of the settlement (Levitan 1989; Hamilton-Dyer 2004, 58; Knight 2007). However there are slight differences in the quantified data between Chichester and Silchester. Whilst Chichester deposits are continuously cattle-dominated, perhaps reflecting the strong preference towards cattle-farming in the local hinterland, early Roman deposits from peripheral areas at Silchester produced a relatively higher frequency of pig. Even higher frequencies of pig were excavated from deposits at the centre of Silchester, with MNI calculations showing pigs to have been the best represented animal in this area (Grant 2000, 432). The zooarchaeological patterns may reflect differences in socio-economic status as well as differences in activity. If whole pigs were sent to elite groups at the centre of Silchester as tribute this could explain this pattern, compared to the Chichester area where pigs, as an 'elite animal', were reserved for consumption at Fishbourne, nearly 2 miles west of the site at Chichester. Unfortunately, without an assemblage from within the settlement at Chichester we are currently unable to compare this pattern.

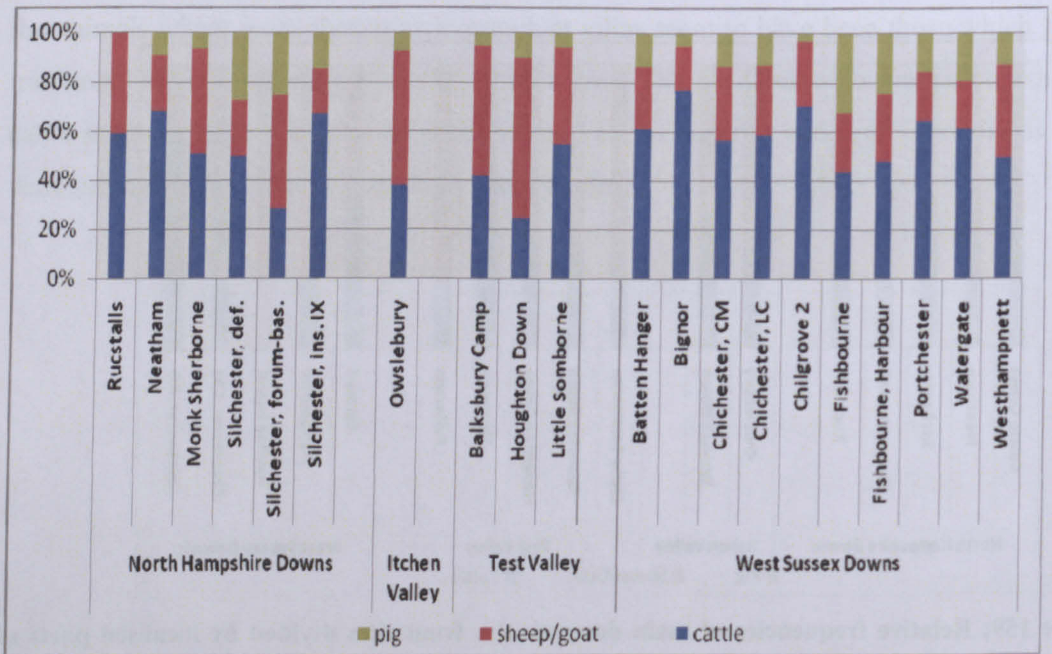


Figure 160; Relative frequencies of main domesticates from sites divided by localised parts of Area 1 of Late Roman date. Calculated as the mean of the total NISP percentages from each site. Includes sites which produced a total fragment count from cattle, sheep/goat and pig of 100+ (for sample sizes refer to Appendix A).

5.1.3 Iron Age: Area 2

Iron Age assemblages in Area 2 generally vary in livestock frequency between different sites. In the middle Iron Age, there is little evidence for the predominance of a single livestock type across a discrete number of sites (Figure 161). Closer to the Cotswolds, the farmsteads at Spratsgate Lane and Warrens Field indicate mixed-farming strategies with cattle and sheep/goats, whereas Groundwell Farm, an enclosed farmstead on the opposite side of the valley, produced a relative lack of cattle, preferring to concentrate on a mixture of sheep/goats and pigs. The high proportion of pig at Groundwell Farm is highly out of character for an Iron Age site and whilst this assemblage showed signs of increased fragmentation there was little to suggest that the percentages indentified were not an accurate representation of the true livestock ratios (Coy 1981, 69-71). Other sites in the wider area also show evidence of relatively high pig frequencies, including the hillforts at Conderton Camp and Uley Bury, in addition to the farmsteads at Aston Mill Farm and Appleford. Apart from the close proximity of Conderton Camp and Aston Mill Farm there is no relationship between these sites and where they were positioned. Whilst the hillforts may have been supplied with pigs as opposed to rearing them on site, the spatial pattern indicates that the decision to husband pigs over sheep or cattle was taken on a site-by-site basis.

Farmsteads closer to the Thames Valley plain at Gravelly Guy and Ashville Trading Estate tend to have focused slightly more on sheep/goat whereas neighbouring Appleford exhibits the highest proportion of cattle of any site in this phase. The hillfort sites at Uley Bury and Conderton Camp produce livestock frequencies in more equal quantities than other rural sites, though with a greater proportion of sheep/goat at Conderton Camp by comparison. The farmstead adjacent to Conderton Camp at Aston Mill Farm showed greater similarities with the farms on the opposite side of the Cotswolds. There is little correlation between land heights and species proportion and Hambleton's (1999, 46) assertion that 'there is...sufficient variation to suggest a degree of intra-regional difference among the Upper Thames Valley faunal samples' rings true. In general, there is little coherence in livestock proportions from Iron Age sites in this area, a pattern also noted by Wilson (1978, 135-136).

Middle Iron Age (c.300-100BC)

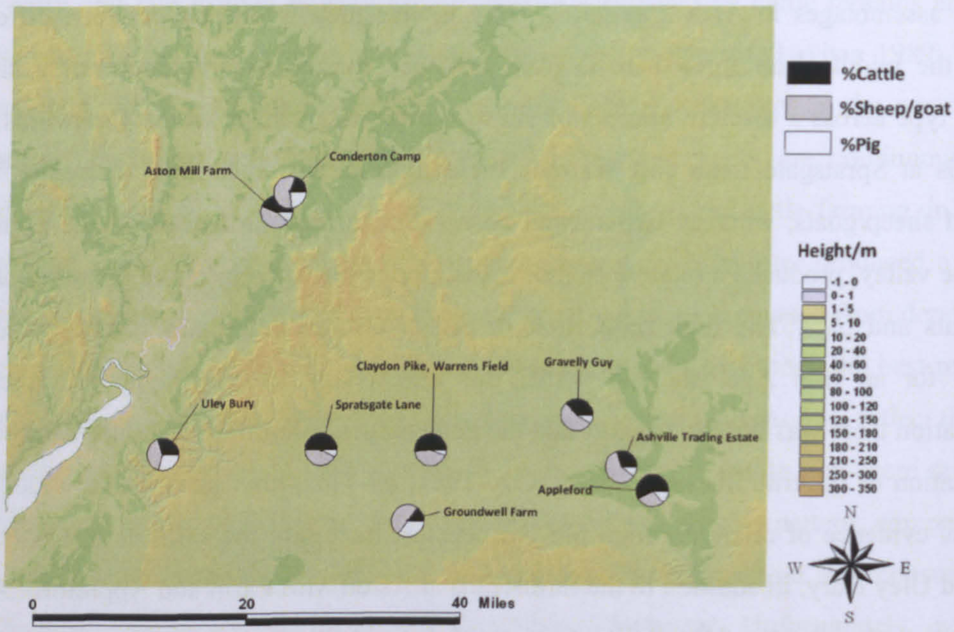


Figure 161; Topographic map of Area Two with Middle Iron Age sites plotted as charts showing the relative frequencies of main domesticates recovered from each – only includes sites which produced a total fragment count from cattle, sheep/goat and pig of 300+

Late Iron Age/transitional (c.100BC-AD100)

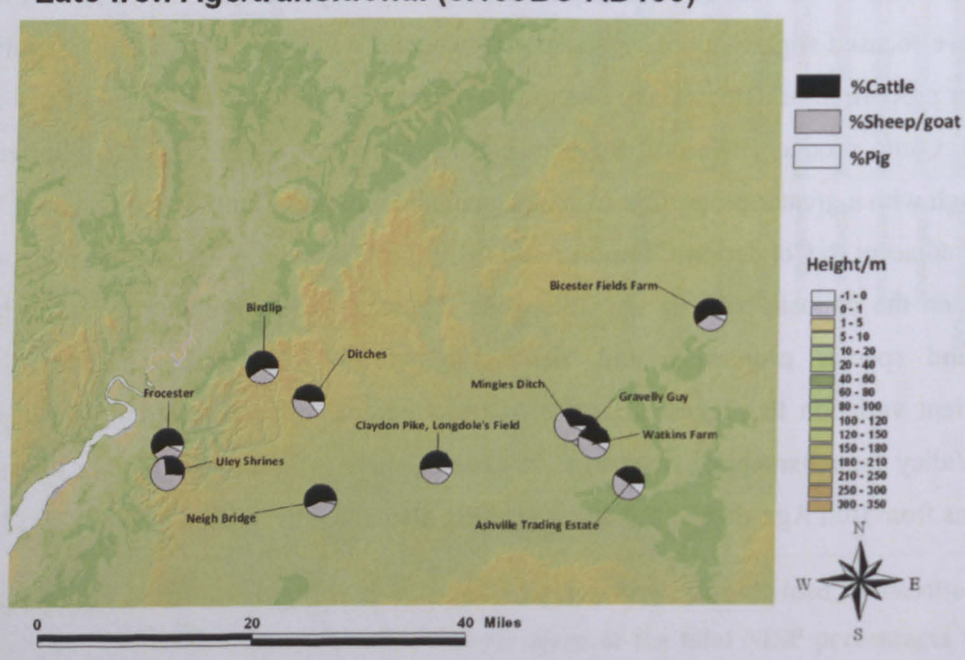


Figure 162; Topographic map of Area Two with Late Iron Age and Transitional sites plotted as charts showing the relative frequencies of main domesticates recovered from each – only includes sites which produced a total fragment count from cattle, sheep/goat and pig of 300+

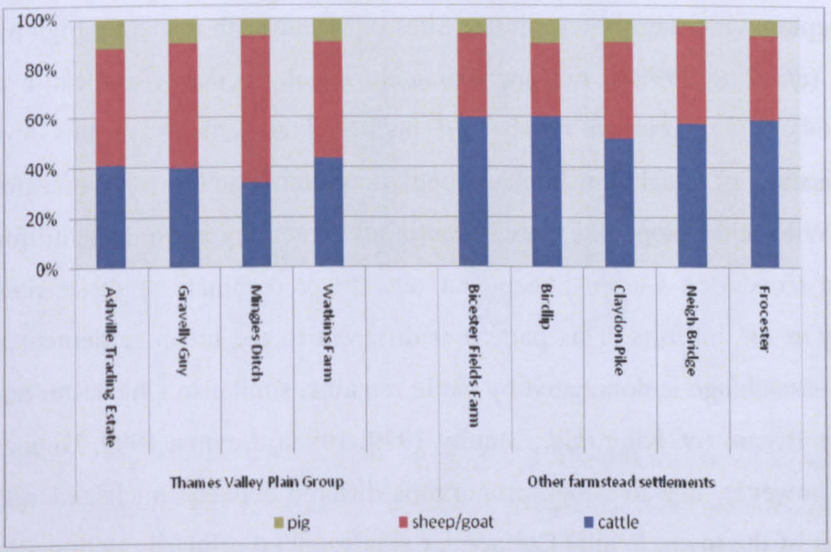


Figure 163; Relative frequencies of main livestock from late Iron Age rural farmsteads in Area 2 (%NISP).

By the late Iron Age the overall indication is that cattle become gradually more frequent (Figure 162). There is also better evidence for more distinct groupings of sites in their species proportions and location. A selection of sites on the east side of the Thames Valley Plain including Watkins Farm, Gravelly Guy, Mingies Ditch, and Ashville Trading Estate, seem to congregate in terms of similar livestock proportions. Compared to other sites in the surrounding hinterland this group shows a pattern of relatively equal cattle and sheep/goat remains, a sub-group which looks to be separate from all the other farmsteads in the surrounding hinterland. Farmsteads elsewhere form a more dispersed group of sites which have increased cattle remains and lower sheep/goat frequencies by contrast (Figure 163). These results do not wholly support the generalised notion that cattle are found in greater quantities to sheep/goat in lower-lying, wetter areas (Wilson 1979, 133; Thomas 2008, 36), instead the spatial data indicates the discrete geographic groupings of sites based around similar livestock proportions. Higher frequencies of pig are evident at the Ditches and Uley Bury hillforts, but were minimal at the religious part of the Uley complex. The assemblage at the Uley shrines was largely dominated by caprine remains, mostly identified as goat which seems to be linked to a cult involving this animal in particular (Levitan 1993). This pattern is in opposition to local farmsteads at Neigh Bridge, Frocester, and Birdlip, each of which demonstrates higher cattle remains.

5.1.4 Roman period: Area 2

The onset of Roman control of Britain brought about a number changes to this area in settlement types and modes of living for many people. The presence of the army is felt by the imposition of military bases at Cirencester and Alchester. The fort at Alchester exhibits a livestock pattern in keeping with many other military sites in Britain with relatively high pig remains at over 20% (*cf.* King 1999b), but approximately equal frequencies of cattle to sheep/goat (Figure 164). The increased number of nucleated settlements in this area evidences the centralisation of much the human population. Small towns at Worcester, Alcester, Asthall, and Wilcote develop, plus there is continuity of activity at Iron Age hillfort sites at Uffington and Conderton Camp. Sheep/goat tend to predominate at these sites, though more markedly at the hillforts. This pattern is different to the urban settlement at Cirencester where the assemblage is dominated by cattle remains, similar to Chichester and other urban sites across Britain (*cf.* King *ibid.*; Maltby 1979; 1998a; Levitan 1989; Dobney *et al.* 1996). It seems however, that livestock proportions differed between nucleated sites depending on the status of the town. Whilst Cirencester was supplied primarily with cattle, the small towns at Asthall, Worcester, and, in particular, Wilcote, demonstrated high sheep/goat frequencies.

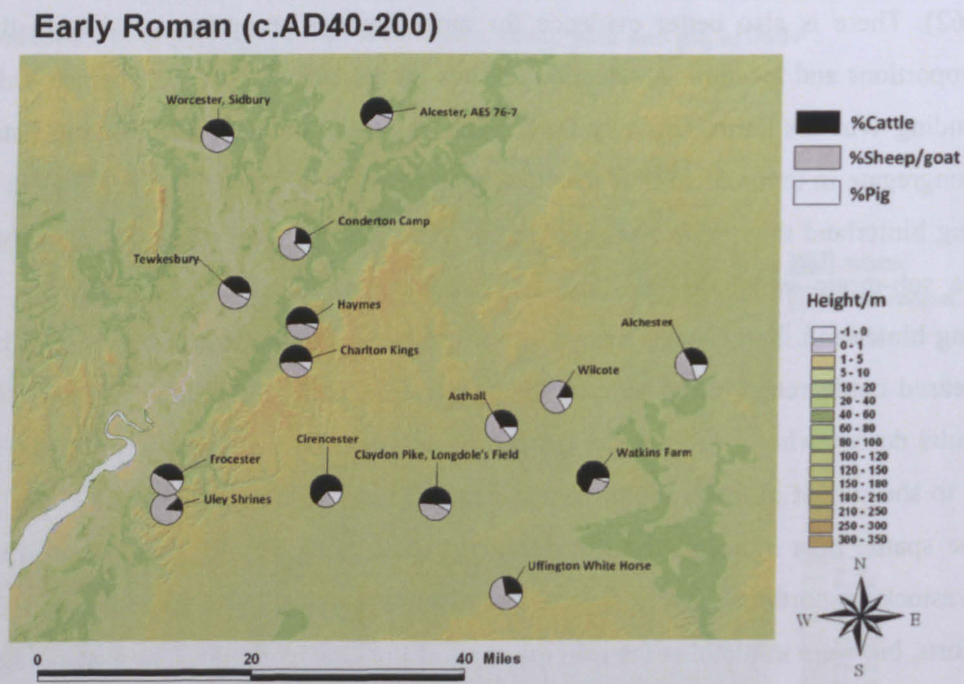


Figure 164; Topographic map of Area Two with Early Roman sites plotted as charts showing the relative frequencies of main domesticates recovered from each – only includes sites which produced a total fragment count from cattle, sheep/goat and pig of 300+

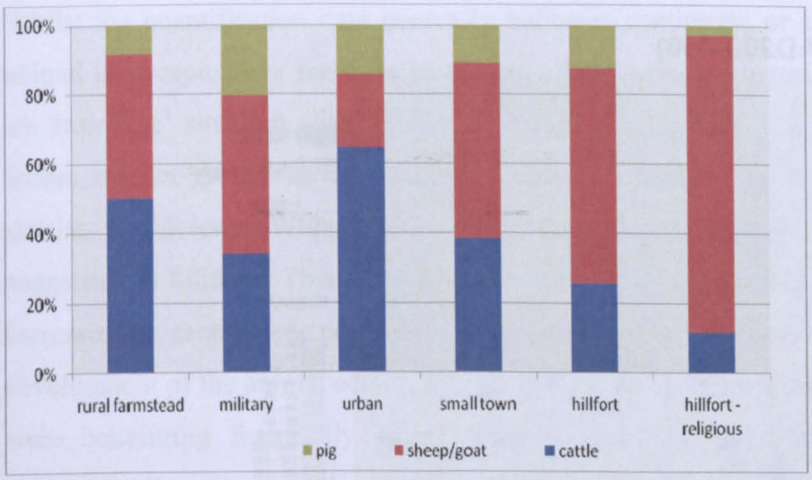


Figure 165; Relative frequencies of main domesticates displayed by site type from early Roman sites. Data sets are calculated as the mean of the total NISP percentages from each site. Includes sites which produced a total fragment count from cattle, sheep/goat and pig of 300+ ('rural farmstead' = 6 sites; 'military' = 1 site; 'urban' = 1 site; 'small town' = 4 sites; 'hillfort' = 2 sites; 'hillfort – religious' = 1 site).

In the late Roman phase there is trend for sites with higher cattle frequencies being situated on the lowest terraces of the river valleys (Figure 166). The small towns at Worcester and Alcester along with the villa at Bays Meadow each produced assemblages higher in cattle and seem to form a group which indicate a prevalence of cattle-rearing in the Severn Valley. Watkins Farm (early Roman) and Farmoor (late Roman) produced cattle frequencies of almost 69% and 63% respectively. Overall, the livestock frequencies from rural farms show a degree of continuity throughout the Roman period, with the higher-status sites indicating increases in cattle and pig remains from the earlier period. The development of local economies through the Roman period was responsible for the expansion in the number of high-status villas. By the later phase villas at Bays Meadow, Frocester, Barnsley Park, Longdoles Field, and Shakenoak produced suitable bone assemblages. Apart from Barnsley Park each of these sites indicated a move towards higher cattle frequencies (Figure 166), reminiscent of the Roman villas of the South Downs.

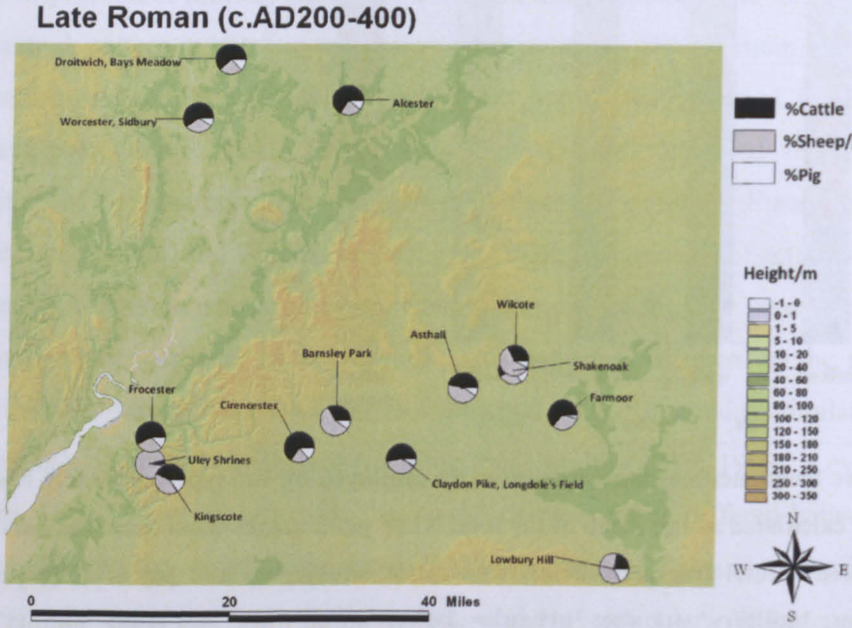


Figure 166; Topographic map of Area Two with Late Roman sites plotted as charts showing the relative frequencies of main domesticates recovered from each – only includes sites which produced a total fragment count from cattle, sheep/goat and pig of 300+

This level of continuity in livestock proportions through the Roman period is, in fact, demonstrated across all the site types in the area (Figure 165; Figure 167). Whilst there may have been differences between individual sites, the overall pattern is one of stability across the region. Each of the hillforts in the Roman period include high sheep/goat percentages and it may be that whilst people do not seem to have been living continuously at these sites, each of these indicate elements of religious practice.

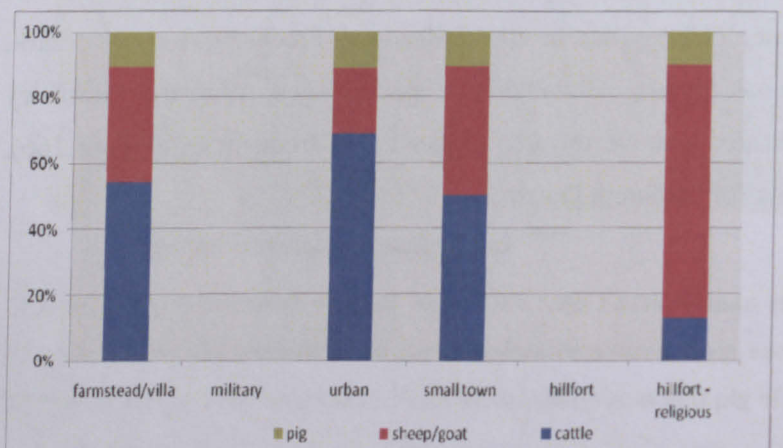


Figure 167; Relative frequencies of main domesticates displayed by site type from late Roman sites. Data sets are calculated as the mean of the total NISP percentages from each site. Includes sites which produced a total fragment count from cattle, sheep/goat and pig of 300+ ('farmstead/villa' = 6 sites; 'urban' = 1 site; 'small town' = 5 sites; 'hillfort – religious' = 2 sites).

Whilst the quantification data generally indicates continuity, or slow development, in the animal landscape, there seems to have been a long-term restructuring of the landscape from an 'Iron Age' situation with small-scale localised groups of farmers who were interacting within smaller groups or, at least, were showing localised affinities and probably shared similar worldviews. Wider group connections could have be formed and temporally negotiated at hillforts. This picture becomes gradually replaced in the Roman period by an increasingly centralised population connected by an improved road system and the development of the animal economy with farms, rather than working in a co-operative style, were benefitting financially from the move towards 'town-life', as indicated by the increasing disparity in settlement status in the area with the widespread villa development (Millett 1990, 186-189). This gradual shift could be correlated with an increase in cattle percentages in the valley areas, though sheep/goat and pigs were relatively frequent here also. At the same time this move towards a wider-spread, lowland economy was separating from a downland pastoral landscape one based around sheep and goat husbandry, but one which was heavily entrenched in religious contexts.

5.2 Animal Husbandry

5.2.1 Pigs

Ageing data from Iron Age sites in Area 1 indicates that alternative methods of pig husbandry were being carried out between different sites (Figure 168). Sites in Area 2 have much reduced sample sizes and provide a less reliable picture of pig management but seem, none the less, indicative of alternative management strategies (Figure 169). Pig-rearing and possibly breeding seems to have been practised at middle Iron Age hillforts as evidenced by relatively high neonatal and juvenile remains at both Danebury, Hampshire (Area 1), and Conderton Camp, Worcestershire (Area 2). Whilst each site includes young adults, both demonstrate an absence of elderly animals. As discussed in the previous chapter, hillforts provided a locus for activities such as specialised breeding of livestock, to which pigs could be herded at particular times of the year. Such a method could be carried out by various surrounding groups, facilitating wider contacts (*cf.* McCormick 1992), but it also reduces inbreeding of localised pig populations, a dominant concern of many pig-rearing communities (Albarella *et al.* 2007, 295). There is evidence that the two hillforts kept differing proportions of young pigs at the sites after birth, a pattern which could be due to localised variation in practice. At Conderton Camp there is a lack of pigs older than 1 year of age but a high degree of piglets being killed in their first year, whereas at Danebury, pigs were generally kept alive for the first few years and then diminish thereafter (Figure 168; Figure 169). Different pig-rearing groups in Corsica and Sardinia slaughter pigs at precise ages, but at ages which vary between groups, a practice which is connected with speed of growth of the animal. Growth rates are a property which is linked to differences in breed (Albarella *et al.* 2007, 300), and it is conceivable that different types of breed existed between Iron Age Hampshire and Worcestershire. Whilst the management practices could have been the same in each area, the timings of these practices varied based upon the biological differences between different groups of pigs. In this sense, the environment affects the 'breed' of pig, which then, due to the ecology of the herd, influences people's behaviour and movement within the landscape.

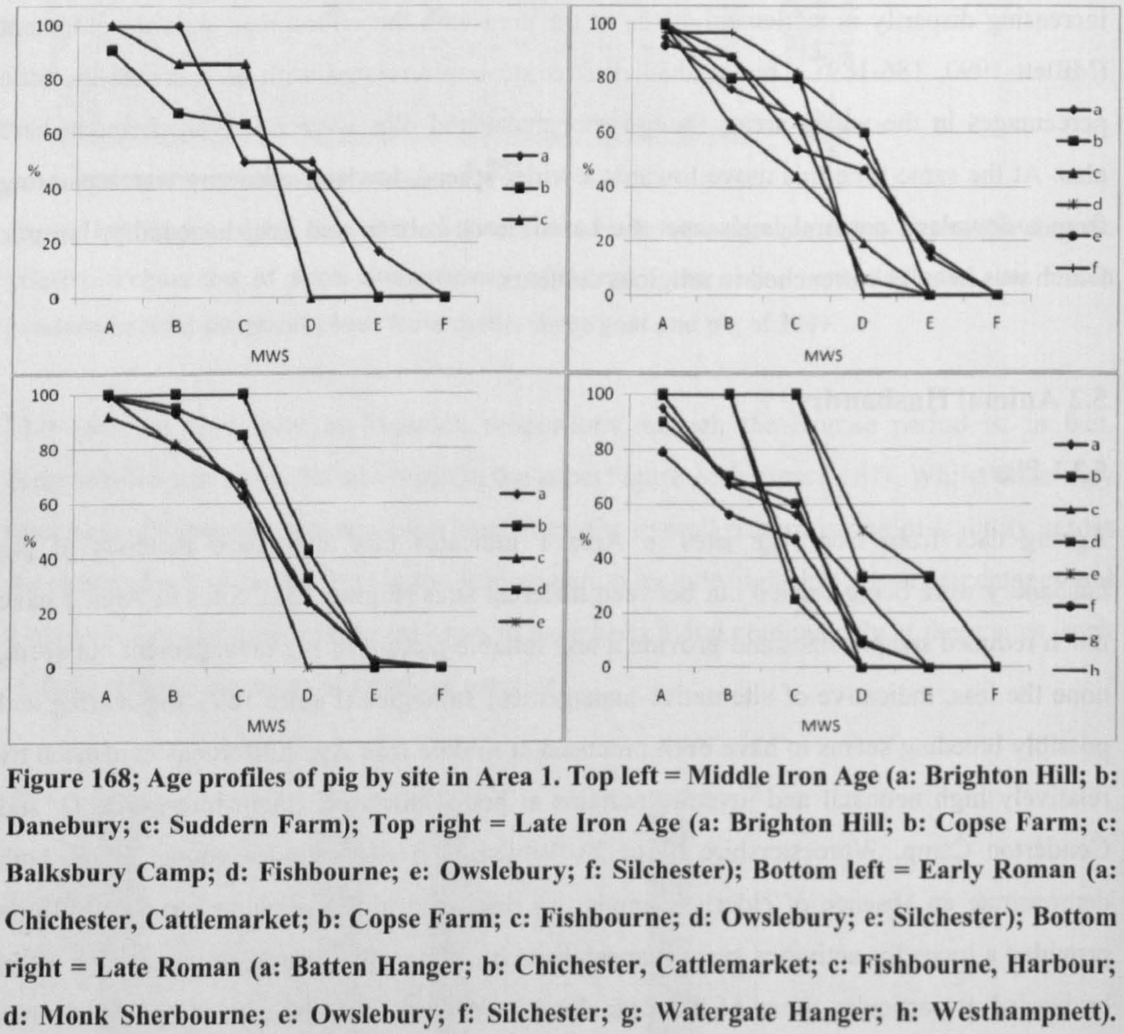


Figure 168; Age profiles of pig by site in Area 1. Top left = Middle Iron Age (a: Brighton Hill; b: Danebury; c: Suddern Farm); Top right = Late Iron Age (a: Brighton Hill; b: Copse Farm; c: Balksbury Camp; d: Fishbourne; e: Owslebury; f: Silchester); Bottom left = Early Roman (a: Chichester, Cattlemarket; b: Copse Farm; c: Fishbourne; d: Owslebury; e: Silchester); Bottom right = Late Roman (a: Batten Hanger; b: Chichester, Cattlemarket; c: Fishbourne, Harbour; d: Monk Sherbourne; e: Owslebury; f: Silchester; g: Watergate Hanger; h: Westhampnett). N.B. Refer to Appendix for sample sizes

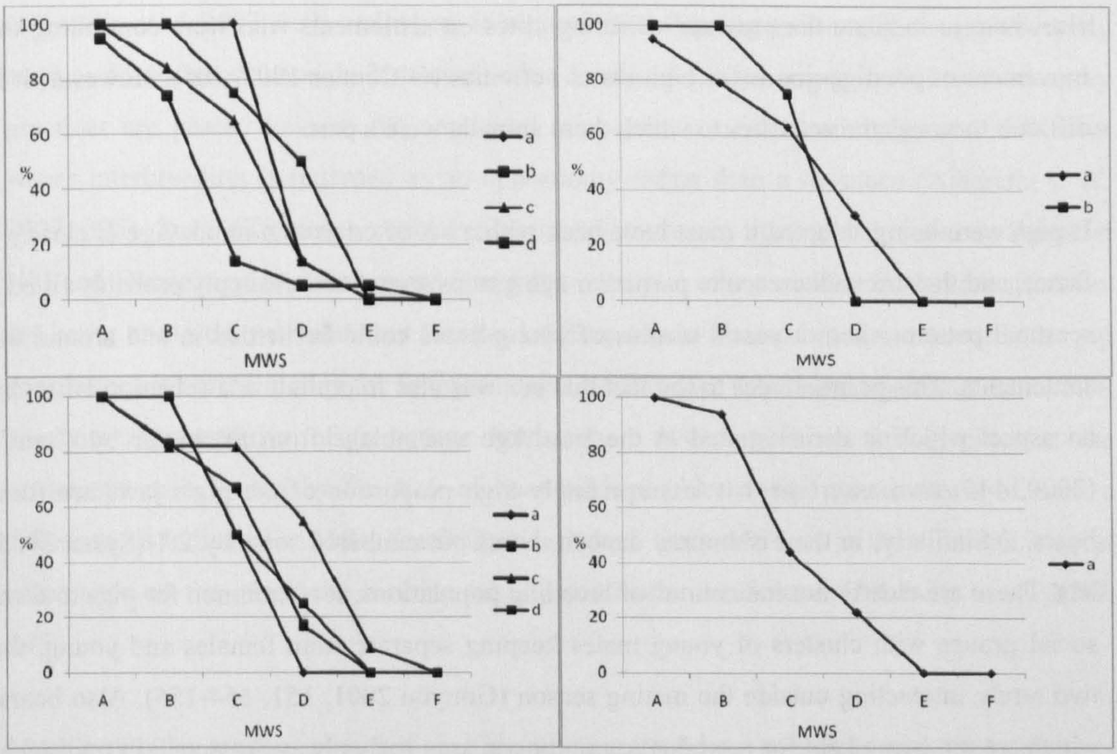


Figure 169; Age profiles of pig by site in Area 2. Top left = Middle Iron Age (a:Aston Mill Farm; b: Conderton Camp; c: Gravelly Guy; d: Spratsgate Lane;); Top right = Late Iron Age (a: Claydon Pike, Longdoles Field; b: Bicester Fields Farm); Bottom left = Early Roman (a: Alcester; b: Alchester; c: Claydon Pike, Longdoles Field; d: Droitwich, Hanbury Street); Bottom right = Late Roman (a: Claydon Pike, Longdoles Field). N.B. Refer to Appendix for sample sizes

In the late Iron Age the enclosed farmsteads at Brighton Hill and Owslebury include samples representing all ages, with the presence of neonates and elderly animals suggesting the breeding of pigs at these enclosed sites. As indicated by the quantification data, the focus of particular livestock activities seems to have shifted away from hillforts in the later period. Age profiles at Brighton Hill show continuity from the middle Iron Age, although the sample size from the earlier phase is very limited. The ageing data from Balksbury Camp indicated an absence of neonates and very old animals but is overall very similar in profile to the data from Brighton Hill and Owslebury. There is no selecting of particular ages for cull; no optimisation strategies which might imply intensive breeding regimes. Instead it seems that pigs were allowed to live, many towards old age, with animals being chosen for consumption at different ages in roughly equal proportions. By contrast, patterns from the enclosed farmsteads are clearly different to those exhibited by the wealthy settlements at Silchester and Fishbourne (the latter is again represented by a late Iron Age ditch deposit). At both elite sites there is clear evidence for the selecting of animals around 1-2 years of age (over 80% at Silchester), with a lack of neonatal piglets (Figure 168), which suggests that these animals were being supplied to the sites. The selectivity of animals of particular ages has been argued elsewhere to indicate the presence of ruling elites on settlements who were controlling the movement of prestige goods for high-status activities (O'Connor 1992, 105). However, it is difficult to assess the activities to which these animals were a part.

If pigs were being selected it must have been with a set of criteria in mind. Age is clearly a factor, and the strict adherence to particular age groups suggests that supply probably fitted a seasonal pattern where a year's surplus of young boars could be herded in and around the settlements. This point alludes to the fact that sex was also important as a selection criterion, an aspect which is demonstrated in the Iron Age assemblage from Silchester by Grant's (2000, 445) own assertion that 'a surprisingly high proportion of the pig's jaws are from boars...' Similarly, in the Fishbourne deposit, boars outnumbered sows by 2:1 (Sykes 2005, 81). These are clearly not indications of breeding populations. It is common for pigs to form social groups with clusters of young males keeping separate from females and young, the two rarely interacting outside the mating season (Gonyou 2001, 151, 154-156). Also boars, which are not being kept for reproduction purposes, are nearly always castrated in traditional pig-rearing practices any time between one month and one year of age (Albarella *et al.* 2007, 299). The interpretation of Grant (2000, 447) for the Silchester assemblage is that pigs were animals brought into Silchester as tribute, and, so that local elites could control the redistribution of 'luxury' goods, in this case pork. As already discussed, the disparity between the low pig frequencies at the outskirts of Silchester were minimal compared to high frequencies in the centre suggesting that the butchery of pigs (the carcasses at least) was importantly on display in this part of the settlement rather than at the periphery where cattle, sheep and goats were dismembered. If pork was being redistributed we should expect alternate body part patterns in different spaces. The data does not necessarily concur with this.

As pigs seems to have been bred at late Iron Age enclosed farms rather than elite sites, people were spending many years taking care of pigs, providing enclosed areas for safety and may be helping sows to rear young. In close living conditions between humans and pigs on enclosed farmsteads close social bonds can form over time (Sillitoe 2001; 2007). Whilst pigs do not seem to have been kept at these sites for the primary purpose of meat exploitation, it may be that they were kept as free-range herds as seen in some modern European communities (Albarella *et al.* 2007). Pigs are known to employ co-operative tactics to forage for food, using 'informed' partners to locate food sources (Held *et al.* 2000, 569), and breeders rarely have problems losing their pigs as the animals are known to instantly recognise their calls (Albarella *et al.* 2007, 301). Hybridization between 'wild' and 'domestic' stock in modern groups is seen by some groups as inevitable but undesirable

(Albarella *et al.* 2007, 299) and where it happens the offspring are usually slaughtered early as they do not grow enough. However, other localised groups using traditional husbandry practices are geared towards the combined management of domestic pigs and wild boar where interbreeding is regarded as an opportunity rather than a nuisance (Albarella *et al.* 2007, 305). Such differences could explain the variation in ageing data between Brighton Hill and Owslebury, and Balksbury Camp for example, where similar husbandry practices are being observed, yet subtle but localised differences in human behaviour towards the pig populations is represented in the faunal remains. In this case the Balksbury Camp data would be more representative of free-range herds where breeding is not taking place at the settlement as indicated by the lack of neonatal and elderly pigs. An example of such a difference is indicated at Mela, South Corsica, where litters are born in the wild, but at most other sites on the island the birthing takes place at the settlements (Albarella *et al.* 2007, 295).

More generally, modern pigs that are free-ranging are driven purposely towards enclosures strictly for slaughter (Albarella *et al.* 2007, 298), which may suggest that late Iron Age enclosed farms ritualised pig lives through both birthing and slaughtering within the enclosures. Morris (2008, 121) notes that 'a noticeable difference between the complete pig and complete cattle and sheep/goat ABGs is that the pig deposits are often found in groups. For example, at Danebury, Houghton Down and Nettlebank Copse, groups of neonatal complete pig ABGs were discovered in the same context, whereas the cattle and sheep/goat ABGs were found isolated.' Again this is an example of human behaviour towards pigs varying from that shown towards cattle, sheep and goats; of localised actions, possibly even reflective of the behaviour of the animals, being reflected in the surrounding landscape.

The importance of the role of pigs across the Iron Age/Romano-British transition was once seen as an important factor in the definition of changing settlements with King arguing that pig frequencies could be viewed on a steady gradient from high percentages on 'more Romanised' sites towards lower percentages on 'less Romanised' sites (see King 1991, 16-17). More recently it has been argued that pig frequencies show a level of continuity over the transition of being better represented on sites of higher-status in both the late Iron Age and the early Roman period (Grant 2002, 18). Ultimately, the current perceived wisdom is that pigs did not increase in importance after AD43 with Albarella's (2007, 397) assertion that 'if [pig] farming practices were being modified, this was not a phenomenon prompted by Mediterranean cultural preferences.' The pig ageing data from Area 1 sites provide an interesting contrast from the late Iron Age pattern, albeit an undramatic one, which might cause us to reassess the present interpretation on a localised basis. Whilst the late Iron Age profiles indicate a pattern of variation, the early Roman data suggest that a degree of homogenisation took place (Figure 168). Each early Roman site tends to show greater similarity in profile with more pigs surviving until over a year but with very small proportions surviving to old age. This does not necessarily represent the level of selectivity which was apparent on late Iron Age high-status sites as the focus on particular age stages is not as extreme, but it does indicate an increased intensity of pig production on settlements, presumably for more specific economic criteria. In other words settlements were placing greater emphasis on keeping pigs for meat production. Data from Area 2 indicate a different pattern again but suffer from small samples sizes in both site number and specimen counts. Only Longdoles Field, Claydon Pike, provides a relatively reliable pattern, one which slightly alters from its late Iron Age pattern but does not indicate any similarity with the Area 1 sites. This could be taken as evidence that the shift seen on Area 1 sites was not taken up elsewhere.

If, as I have tentatively argued already, late Iron Age pig populations were kept in free-ranging herds and moved towards particular sites for specific husbandry practices, the early Roman pattern from sites in Area 1 indicates that a more regulated pattern of management had ensued. Many authors have argued that agricultural practices had intensified across the South Downs and coastal plain through the Iron Age/Romano-British transition (Hill 1995; Cunliffe 2000; Dark 2000). From an environmental perspective there is a potential incompatibility between free-range pig-husbandry and agriculture (Redding and Rosenberg 1998). Objectively, pigs are seen as damaging to areas used for growing plants, which creates a perception that pigs are not animals that should be kept in such spaces. If this conceptual change took place it must have factored in the ways that pigs were managed. The increase in cattle frequencies seen in this area across the transition also hints at the growth in land used for agriculture and, when interpreted with the evidence for changing pig husbandry, may show that the relationship between landscape space and the animals was being reconfigured on a conceptual level (for other examples of topological animal/environment rearrangement see Whatmore and Thorne 1998). So if cattle became associated with agricultural space across the transition (at this point this phenomenon has not yet been sufficiently assessed or proven), what was the consequence for pigs?

Ervynck *et al.* (2007, 173) argue that pigs underwent a cultural evolution in late medieval northern Europe from forest-dwelling to farm-based animals and such a change clearly hints at an important change to the ways pigs were being moved through the landscape. In the medieval period, the use of the forest, along with pig-herding has been suggested as being associated with the aristocratic economy (Ervynck *et al. ibid.*). As already argued, rather than a strict high/low-status dichotomy being reflected by pig husbandry in the late Iron Age, more complex socio-economic and ritual dynamics seem to have been involved. Where the Iron Age pattern suggests the presence of a 'free-range' pig environment, one tied up with local kinship exchange systems, methods for husbanding pigs on early Roman sites seems to have moved towards more intensive breeding. In modern Corsica and Sardinia traditional pig-herding is still practised but is rapidly disappearing in the face of economic development, being replaced by intensive production systems (Albarella 2007b, 307). On a site-based scale this would suggest a move towards sty-rearing; and a shift from free-range towards sty-kept animals means that people and pigs were spending additional time together, with humans being more involved in the daily lives of their pigs. Modern studies indicate that pigs, which are accustomed to positive human attitudes in enclosed spaces, respond with higher rates of reproduction (Hemsworth 2007), and this knowledge would run concurrently with an emphasis on economic perspectives. Such notions also echo the ancient Latin scriptures, as in Columella (*De Re Rus.* 7.9-13), where the importance of sty-kept pigs went hand-in-hand with farm ownership. Whilst this treatise cannot be taken as a model of Romano-British farming, the increasing quantities of imported goods into the south of England must also be associated with the transfer of ideas and knowledge which could influence people's behaviour on a localised level. The general lack of elderly animals could indicate that a focus on herd structure was being adhered to, with a reduction in older animals and only those needed for reproduction purposes being kept at individual sites rather than allowed to roam in feral populations. This again supports the notion of more regulated management of pigs and, on a wider scale, more regulated management of the countryside. Such a change must also imply a change in the perception of the landscape. With economic development comes the ordering of land and the idea that it can be owned (Johnson 2007, 152-157), and keeping pigs for meat rather than simply companion animals (although the two notions are unlikely to be truly separate in pre-modern societies) hints at a move towards materialist concerns commonly tied up with transforming land (and animals) into private property (*cf.* Wylie 2007, 59). To examine these ideas further the role of pig husbandry needs to be viewed in correlation with that of cattle, sheep and goats, to which the focus of discussion now moves.

5.2.2 Cattle

The shift from sheep to cattle farming is generally seen as one of the defining phenomena of the Iron Age/Roman transition in Britain (King 1984; 1999a; Albarella 2007), and it has been regularly pointed out that this development mirrored economic changes in Britain in response to emerging market economies and consumer-orientated populations (Maltby 1984, Grant 1989; Dobney 2001, 36-37; Albarella *et al.* 2008, 1829). Cattle age profiles from middle Iron Age sites in Area 1 indicate that husbandry practices vary quite markedly between different sites (Figure 170). During this phase, cattle were rarely kept to old ages in high proportions. Only at Rooksdown and Winnall Down were small frequencies of older cattle present to some degree. Evidence for cattle breeding is present at these sites due to the increased proportion of neonates at both. Danebury also exhibits a relatively high proportion of immature calves and a general absence of cattle older than c.3 years of age, a trend which Grant (1984) has suggested is possible evidence of a specialist breeding centre.

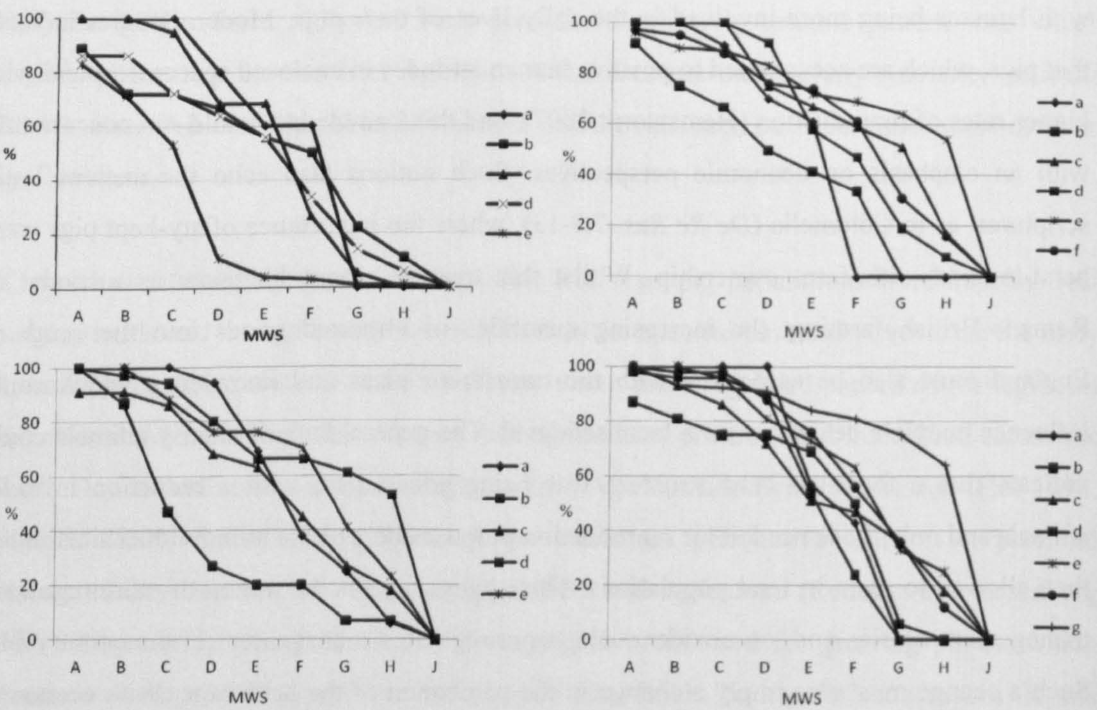


Figure 170; Age profiles of cattle by site in Area 1. Top left = Middle Iron Age (a: Brighton Hill; b: Rooksdown; c: Suddern Farm; d: Winnal Down; e: Danebury); Top right = Late Iron Age (a: Brighton Hill; b: Suddern Farm; c: Copse Farm; d: Silchester; e: Owslebury; f: Balksbury Camp); Bottom left = Early Roman (a: Copse Farm; b: Fishbourne; c: Silchester; d: Owslebury; e: Chichester, Cattlemarket); Bottom right = Late Roman (a: Westhampnett; b: Monk Sherbourne; c: Watergate Hanger; d: Silchester, Insula IX; e: Batten Hanger; f: Chichester, Cattlemarket; g: Owslebury). N.B. Refer to Appendix for sample sizes

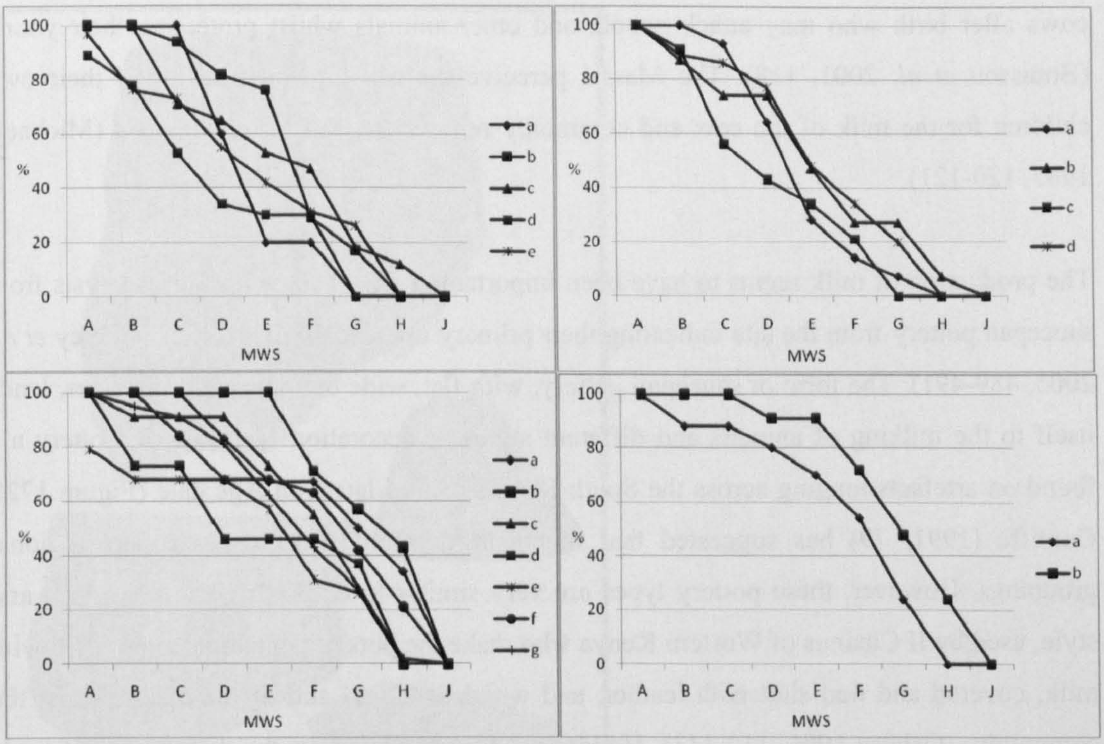


Figure 171; Age profiles of cattle by site in Area 2. Top left = Middle Iron Age (a:Aston Mill Farm; b: Claydon Pike, Warrens Field; c: Spratsgate Lane; d: Gravelly Guy; e: Conderton Camp); Top right = Late Iron Age (a: Bicester Fields Farm; b: Watkins Farm; c: Mingies Ditch; d: Claydon Pike, Longdoles Field); Bottom left = Early Roman (a: Alchester; b: Droitwich, Hanbury Street; c: Alcester; d: Conderton Camp; e: Asthall; f: Droitwich, Dodderhill; g: Claydon Pike, Longdoles Field); Bottom right = Late Roman (a: Claydon Pike, Longdoles Field; b: Cirencester [Maltby]). N.B. Refer to Appendix for sample sizes

The relatively high proportion of neonatal individuals indicates that cattle were birthed at the site though it is impossible to know whether the act of mating was carried out on site. Females were either kept in situ until birth, or were driven in towards the end of gestation. Middle Iron Age ageing samples from the enclosed farm at Suddern Farm indicate a lack of very young animals and different age profile to that at Danebury, Rooksdown and Winnall Farm (Figure 170). Only one mandible could be attributed to a yearling calf indicating that, whilst calves may have been reared on site, calving itself was not a primary occupation. Instead the large majority of cattle were bulls (Hamilton 2000, 185), possibly indicating a separation in the breeding stock. This is a common system in many pastoral regimes where males are kept separate after weaning (Bouissou *et al.* 2001, 120).

The high proportion of young cattle may indicate attempts to manage continual breeding of cows in order produce a year-round milk supply, a practice which Pliny (*Hist Nat.* 8.177) describes as common of 'non-Roman nations'. The removal of calf from mother for milking is important not only for the procurement of the milk but also to reduce the aggressiveness of cows after birth who may attack people and other animals whilst protecting their young (Bouissou *et al.* 2001, 118). The Massai perceive the calf as a competitor of their own children for the milk of the cow and commonly remove the calf for this reason (Michaels 1987, 120-121).

The production of milk seems to have been important at Danebury with lipid analysis from saucepan pottery from the site indicating their primary use as dairy containers (Copley *et al.* 2005, 489-491). The form of saucepan pottery, with flat, wide bottoms and high sides, lends itself to the milking of animals and different styles of decoration on saucepan pottery are found on artefacts ranging across the South Downs of mid-late Iron Age date (Figure 172). Cunliffe (1991, 79) has suggested that the distribution of these styles reflect regional groupings. However, these pottery types are very similar to calabash vessels, in form and style, used by Il Chamus of Western Kenya who make the pots as containers to be filled with milk, covered and tied shut with leather, and which is stored and distributed amongst the community (Osborn 1996, 112-113). Hodder (1982, 68) notes that the distribution of these pots relates to localised contacts rather than divisions between ethnic groups and that they were made by women in different communities who decorated them, but who would copy and design patterns used by neighbouring communities. The designs thus reflect dynamics of milk redistribution throughout the local community; for example, small calabashes with incised or burned designs were filled with cattle or goat milk and given to children around 7 to 8 years of age (Hodder 1991, 73).

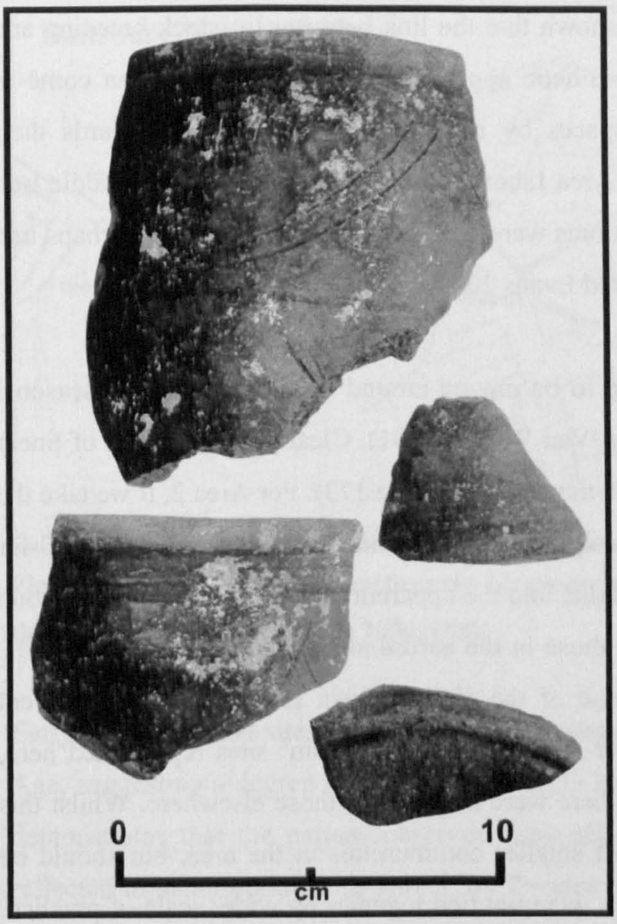


Figure 172; Fragments of saucepan pottery from Carne's Seat, West Sussex (photo taken by author; material property of Chichester District Council collections)

Age profiles from sites in Area 1 in the late Iron Age are similar to those of the middle Iron Age, though subtle changes took place (Figure 170). There tends to be a greater proportion of older cattle on many sites. Data from the enclosed farmstead at Owslebury, in particular, indicated that over 50% of the cattle population lived to at least 8 years of age. Whilst this indicates a noteworthy shift in human-cattle behaviour, other sites, such as Copse Farm and Balksbury Camp, were also keeping older cattle, suggesting that practices were also changing elsewhere. In terms of herd sizes this pattern may indicate the presence of smaller herds being kept at individual sites as a lower frequency of dairy culling was not sustained (Hambleton 1999, 87).

The overall pattern from Area 1 is not followed by the ageing data from sites in Area 2, where the proportions of older cattle are generally lower (Figure 170), a trend also noted by Hambleton as reflecting the presence of large herds in the area the higher frequency of young animals being culled as an indication that large herds would be needed to sustain such a practice (Hambleton *ibid.*). If these are true patterns then the sight of large herds in one place, compared to small herds in another, places alternative aesthetic properties on each area. Evans and Yarwood (1995) have shown that the link between livestock breeding and management is intimately tied to the aesthetic appearance of landscape and can come to represent the people living in those spaces by reflecting their behaviour towards their animals. The late Iron Age pattern from Area 1shows one of continuity from the middle Iron Age indicating that cattle husbandry customs were being maintained, and were perhaps tied to a sense of local history (*cf.* Yarwood and Evans 2000).

Increased herd sizes would have needed to be moved around the landscape on a seasonal basis so that pasture could regenerate (*cf.* Van Wieren 1991). Clearly the presence of linear features on the South Downs reflects such movement (Figure 173). For Area 2, if we take the ageing data as evidence for transhumance/agro-pastoral regimes (see Blench 2004, 12-13 for definitions), this may provide further insights into the apparent separation between the group of sites in the Thames Valley basin and those in the surrounding topography (Figure 171). The ageing data from Mingies Ditch, one of the Valley Basin group, shows a different pattern of cattle management to the other three 'non-Valley Basin' sites represented here, indicating that the practices taking place here were different to those elsewhere. Whilst this might represent independent behaviour of smaller communities in the area, but should be taken as evidence that people in each area were not tied together by wider scale of practice. If livestock were continually, presumably seasonally, moved between the two environments in the area the relatively equal frequencies of cattle and sheep/goats in the former group simply shows where these animals finished their lives rather than being places where one taxa was favoured over another. Furthermore, the movement of livestock and the wider social and economic patterns are reflective of temporal human practice rather than an indication of where livestock are more suitably placed, and it is the movement of people and cattle which ties them to the landscape not their position within *separate* environmental niches.

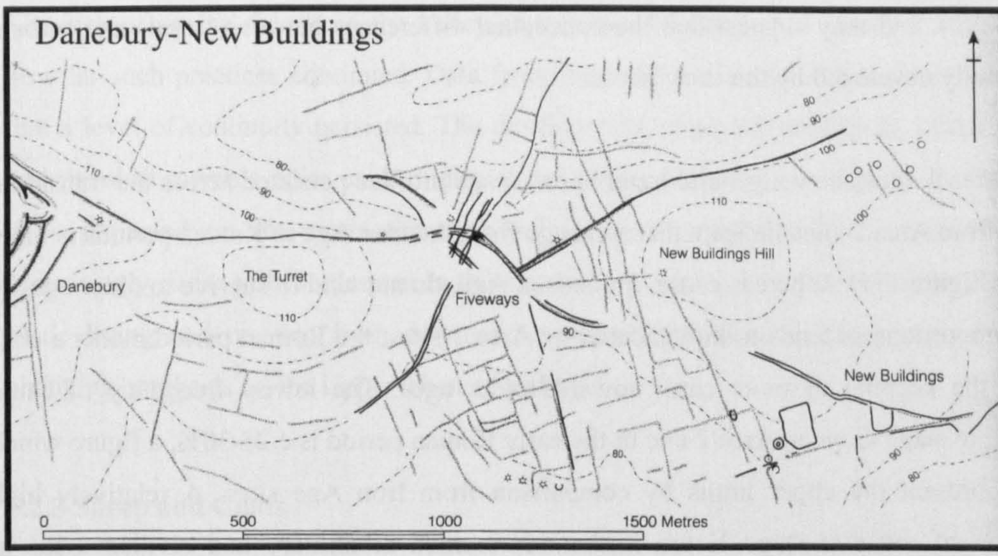


Figure 173; Iron Age linear earthworks (droveways) and field-systems between Danebury and the Test Valley (after Cunliffe 2000, 158).

Early Roman period sites in Area 1 indicate ageing profiles similar to those in the late Iron Age, suggesting a degree of continuity in cattle husbandry existed across the transition, and demonstrates that the pattern observed from sites across the country was not necessarily reflected in localised areas (Figure 170). Greater frequencies of elderly cattle continue to be evident at Owslebury, a pattern which persists through to the late Roman phase suggesting that people here were able to preserve their cattle-farming activities over a sustained period of time, maybe reflecting strong, close bonds between humans and their cattle. The age profile at Owslebury points towards the presence of smaller cattle herds which were not kept for optimised economic gain, except maybe for the employment of cattle in agricultural activities.

The absence of neonatal and infant cattle at Copse Farm (early Roman phase) indicates that cattle were moved to the site rather than being bred there. This combines with evidence for imported cereals, onsite industrial working, and a relatively high quantity of horse remains at the site (Davenport 2003, 105; Bedwin & Holgate 1985), which might indicate an area involved with the movement of people to and from the locality. In this sense Copse Farm is not a 'traditional-style' farm but a rural site involved in trade and exchange. Whilst inhabitants at Owslebury were engaging with cattle over long periods, rearing young, pasturing the animals, and engaging with them to plough the surrounding landscape, the evidence from Copse Farm suggests little contact with cattle other than through exchange, culling and butchery of the animals. Such variation must reflect the differing identities of people living within localised landscapes. Certainly, cattle supplied to the emerging town centres at Chichester and Silchester were exploited at similar ages to those at Copse Farm

(Figure 170), and may suggest that the conceptual differences between 'rural' and 'urban' had not fully developed by the early phase.

Whilst Area 1 sites show a general trend in cattle age profiles persisted across the transition, profiles from Area 2 sites indicate that a change from the Iron Age to Roman periods is more marked (Figure 171). Whereas cattle, in the Iron Age, do not tend to survive to older ages in higher proportions as tends to be indicated by Area 1 sites, the Roman period marks a shift towards the keeping of more cattle towards older ages. The lowest frequency of cattle surviving to stage G on an Area 2 site in the early Roman period is c.25-30%, a figure which would represent the upper limits by comparison from Iron Age sites. A relatively high proportion of cattle at stage H are further represented at military and civilian areas in Droitwich and the military site at Alchester, although the sample size is small for the latter. The patterns as with the livestock proportions in this area seem to have been affected by the changing nature of settlement function, which saw a greater proportion of cattle moving towards densely populated centres. The increased proportion of cattle surviving to fully mature size, c.2-3 years, plus a higher though differential proportion of older animals surviving at different sites has been taken elsewhere as indicating the importance of agricultural practice combined with meat production (Sherratt 1981, 284-285).

Cattle were probably also viewed in terms of portable wealth, an idea commonplace in many ancient societies (Barker 1992; McCormick 1992; Schwabe 1994, 40-41). Such a perception of cattle would have seen them be part of many social acts beyond that of simply meat production and/or draught. As demonstrated earlier, the use of cattle as bridewealth is common in many societies, a good example being the Nuer and Dinka groups in southern Sudan. As Evans-Pritchard (1951, 89) states: 'A man who receives only one cow of the bridewealth has in it the promise of a herd'. Here cattle are used in gift exchange to generate links between the two communities (Burton 1981, 157-159). In these occasions communities could come together to cement such ties, usually in spaces in between denser settlements so that social ties can be negotiated and where identities may be altered or maintained. Such events have been shown to take place in the Iron Age where evidence of gatherings and feasting is indicated at significant places in the landscape (Hill 1995). The age profile for cattle in Area 2 during the late Iron Age indicates that animals were killed mainly for meat. The production, movement and consumption of animals would have been central to these ritual acts as an integral part of the social concerns of each community. This notion is reinforced somewhat by the suggestion from Mattingley (2006, 393) that this area in particular seems to have been a liminal zone between Iron Age polities.

The lack of ageing data from the valley area in the Roman period makes it difficult to see how far such practices continued. Data from the rural settlement at Claydon Pike suggests that a level of continuity persisted. The development of denser settlement, towns and forts, and the shift towards older cattle indicates reforming exchange systems. Such change must have impacted on the ways these animals were moving through the landscape. The increasingly dense villa settlement in the Cotswolds may have helped drive this change with cattle living and moving from downland areas towards dense settlements rather than a changing emphasis on the Upper Thames Valley.

5.2.3 Sheep and Goats

There has been general agreement regarding the dynamics of sheep/goat husbandry regimes, with studies suggesting that the Downs supported a linked arable economy (Grant 1984b; Maltby 1994; Hambleton 1999). Certainly, sheep/goat data show remarkable similarity overall in age profile despite the larger dataset compared to pig and cattle (Figure 174). Disregarding nuances, overall patterns in the Iron Age data suggest that sheep/goat husbandry practices were generally uniform across the wider area and localised distinctions are not apparent. Considering that sheep/goat remains consistently produced the greatest quantity of faunal remains on most sites across Area 1 the continuity in sheep/goat husbandry seems to have continued across a relatively wide area, a pattern seemingly different to that indicated by cattle and pig-rearing.

In the middle Iron Age the enclosed farmsteads at Brighton Hill and Houghton Down deviate slightly from the main group of sites with a smaller proportion of sheep/goats living past early adulthood suggesting that eating sheep/goats was more important at these sites compared to the others, particularly Suddern Farm which provides the other outlier for data at stage E where almost 50% of the population survives. These differences to the 'Area norm' may be due to differing status as Suddern Farm is known to have been a higher-status site compared to Houghton Down for example (Hamilton 2000, 71), which is more similar to Brighton Hill. Overall the middle Iron Age data indicate that most sites have a relatively high proportion of animals culled by stages B and C possibly indicating a level of specialisation in sheep/goat husbandry (*cf.* Halstead 1996, 22-23).

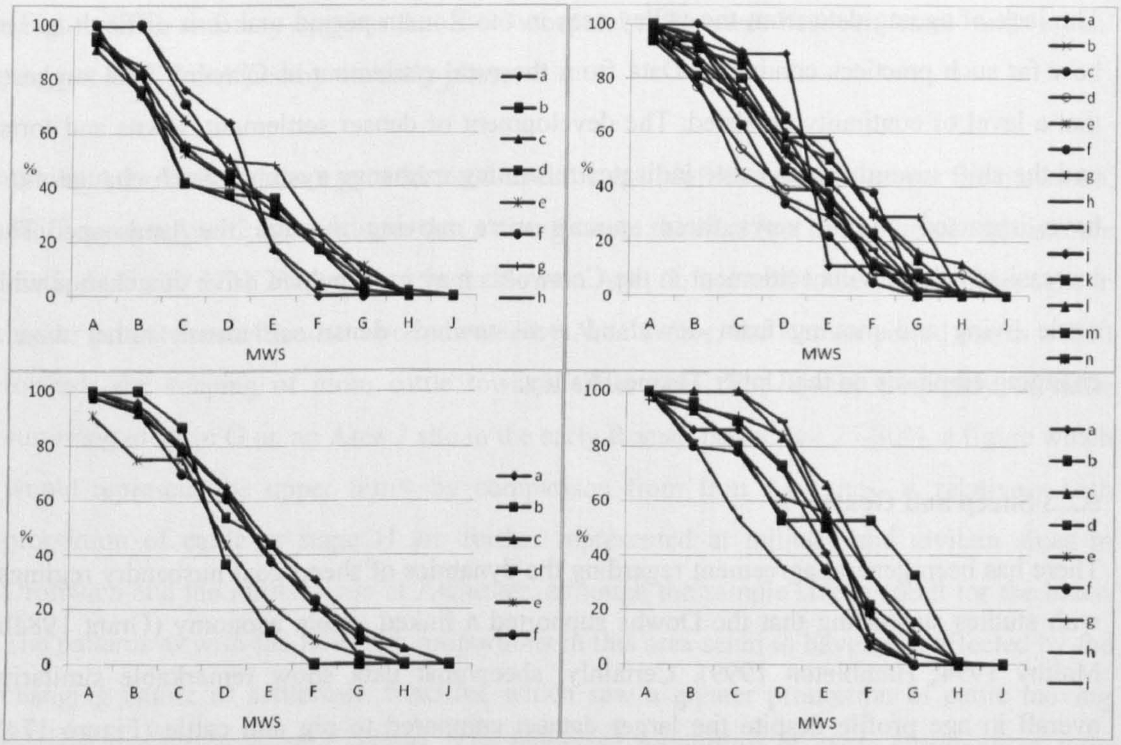


Figure 174; **Age profiles of sheep/goat by site in Area 1. Top left = Middle Iron Age (a: Brighton Hill; b: Danebury; c: Houghton Down; d: Old Down Farm; e: Owslebury; f: Rooksdown; g: Suddern Farm; h: Winnal Down); Top right = Late Iron Age (a: Abbotstone Down; b: Balksbury Camp; c: Brighton Hill; d: Copse Farm; e: Danebury; f: Houghton Down; g: Lavant; h: Micheldever Wood; i: Nettlebank Copse; j: North Bersted; k: Owslebury; l: Rooksdown; m: Silchester; n: Suddern Farm); Bottom left = Early Roman (a: Chichester, Cattlemarket; b: Copse Farm; c: Fishbourne; d: Owslebury; e: Silchester; f: Winnal Down); Bottom right = Late Roman (a: Batten Hanger; b: Chichester, Cattlemarket; c: Fishbourne, Harbour; d: Monk Sherbourne; e: Owslebury; f: Silchester, forum-basilica; g: Silchester, Insula IX; h: Watergate Hanger; i: Westhampnett). N.B. Refer to Appendix for sample sizes**

The late Iron Age data do not indicate any distinct groupings of sites existed. A relatively increased difference exists between the percentage survival rates at age stages C, D, and E, reflecting nuanced variation in practice. The overall change in age profile from the late Iron Age to the early Roman period is minimal suggesting that sheep/goat management practices continued to a large degree. The greater range of frequencies at particular stages in the late Iron Age may well be a result of the greater number of sites which produced suitable data. There are some slight shifts however, as sheep and goats tend to survive in greater frequencies on Roman period sites than they did on Iron Age sites. The sample from the early Roman phase in particular is greatly restricted at stage C compared to the wide range exhibited by late Iron Age sites at the same stage. However, it is difficult to see whether this is a real pattern or a product of the greater sample of late Iron Age sites. The shift towards a greater proportion of infants and juveniles surviving does seem to be a gradual change from the middle Iron Age to the early Roman period rather than a distinct change across the Iron Age/Roman transition.

The age curves of the early Roman period indicate the possibility of two groups. Chichester Cattlemarket, Fishbourne, Copse Farm, and Winnall Down all indicate similar profiles compared to Owslebury and Silchester where a greater quantity of samples at stages D, E and F were produced. The late Roman period curves suggest greater differentiation between sites was evident. The general trend in this phase is for an increased killing of animals between stages D and G placing greater emphasis on meat and wool production. Such a shift could signify the developed nature of urbanisation by that period. An interesting shift which takes place from the mid Iron Age to the late Roman period is the surviving rate of sheep and goats at stage D in particular. In the middle Iron the survival rate sits around 40-50%; the late Iron Age concentrates between 50-60%; the early Roman period focuses at 55-65%; the late Roman period indicates a survival rate extending up from 55% to 85%. This shift may indicate a move away from specialising in particular products towards a more generalised pattern of animal husbandry, coupled with the increased range in survival rate in the late Roman period possibly signifying the differences between site function and a more marked dichotomy between 'producer' and 'consumer' sites.

Halstead (1996, 26) has argued that the large-scale exchange of animals for meat may be detectable by 'crooked' mortality curves with the selected age group underrepresented at producer sites and overrepresented on consumer sites. It seems true that the data from urban sites at Silchester and Chichester Cattlemarket indicate an increased proportion of sheep/goat samples around stages E to G, whereas rural settlements such as Monk Sherborne and Owslebury include a relative shortage of samples at stage E. This may highlight the rural-urban dichotomy present at the same time showing the link between the two. Interestingly villas such as Batten Hanger and Watergate Hanger give relative frequencies closer to the urban centres than other rural sites, suggestive that some rural sites, possibly higher status ones, were not exporting as many mature sheep to towns in this area but rather keeping the majority on site.

Such a general temporal shift provides a reasonable argument that sheep and goat were generally managed and moved through the landscape differently from the Iron Age to the Roman period, though over the long term rather than the transition. If specialisation was a feature of the Iron Age, particularly the middle Iron Age, it suggests a greater use of pastoral systems of management (*cf.* Halstead 1996, 23-24). This looks to have shifted towards generalisation in husbandry practice into the Roman period ending in small-scale stock rearing on rural settlement with rural-urban pathways opening up (*cf. ibid.*).

In Area 2 the sheep/goat ageing profiles indicate an increased level of variation in husbandry practice between different sites (Figure 175). In the middle Iron Age this ranges from sites which engage in a greater degree of specialisation through the presence of a greater frequency of lambs/kids being slaughtered (*cf.* Payne 1973; Halstead 1996) at sites such as Gravelly Guy and Conderton Camp. This is coupled with several sites which display absences of samples at particular stages, different at each site. For instance, there are no specimens at stage E from Aston Mill Farm and none at stage D from Claydon Pike. These absences are notable when there are relatively high proportions in stages on either side and each site includes a relatively good sample size. The inference from this pattern is that herds of sheep were absent from some sites at different times of the year, suggestive of transhumant herds (*cf.* Halstead 1996, 23-24). The late Iron Age data is characterised by two types of site firstly those with peaks at early stages, generally stage C suggestive of lamb/kid culls around 1 year old, such as the enclosed farmsteads at Mingies Ditch, Barton Court Farm, and Watkins Farm, again suggestive of product specialisation. The second group includes sites with peaks which spread over later stages, generally D to G, such as Claydon Pike, Ditches hillfort, and Bicester Fields Farm.

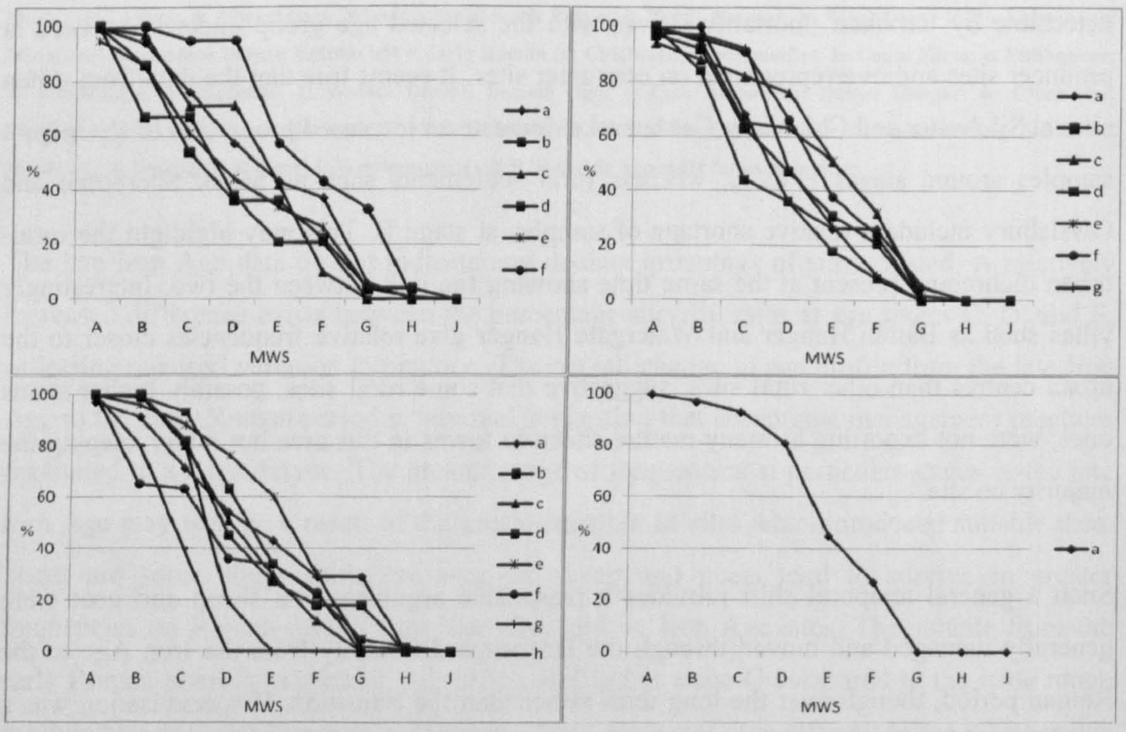


Figure 175; Age profiles of sheep/goat by site in Area 2. Top left = Middle Iron Age (a: Ashville Trading Estate; b: Aston Mill Farm, c: Claydon Pike, Warrens Field; d: Conderton Camp; e: Gravelly Guy; f: Spratsgate Lane); Top right = Late Iron Age (a: Ashville Trading Estate; b: Barton Court Farm; c: Bicester Fields Farm; d: Mingies Ditch; e: Watkins Farm; f: Claydon Pike, Longdoles Field; g: Ditches); Bottom left = Early Roman (a: Alcester; b: Alchester; c: Asthall; d: Barton Court Farm; e: Claydon Pike, Longdoles Field; f: Conderton Camp; g: Droitwich, Hanbury Street; h: Uffington White Horse); Bottom right = Late Roman (a: Claydon Pike, Longdoles Field). N.B. Refer to Appendix for sample sizes

There exists a similar overall pattern between late Iron Age to Roman period in Area 2, despite greater variability than sites in area 1. The small town at Alcester included samples at most stages including A and B suggestive of breeding on site though a high proportion (28.6%) survived to at least stage H. Most other sites follow the late Iron Age pattern of peaks spread across stages D to G. The indication is that, despite the apparent variation in age profiles, a general shift in practice took place from the middle Iron Age to the late Iron Age. The former seems to have been predominantly a pastoral landscape with some sites breeding adults and culling young to others which were used as bases for herds to move towards most likely at different times of the year as pasturage changed. This changed to an economically heterogeneous landscape of the late Iron Age. Pastoralism continued with the presence of product specialists though the emergence of small-scale stock farmers at sites which allowed greater quantities of young to survive, presumably for a more generalised use of the herd. By the early Roman period, this type of sheep/goat husbandry seems to have dominated, with little evidence for specialisation in products.

5.3 Discussion

Analysing faunal remains data in this way is not without its pitfalls. The manner and size and extent to which sites are excavated will affect the proportions of animals recovered. The spatial analysis of livestock remains given above identify general patterns across the areas, some of which relate to particular places in the landscape. In some areas, sites which are situated within particular environments, such as individual river valleys seem to form similarities in domesticate frequencies. The sheep-dominated Iron Age rural sites of the Hampshire Downs or the cattle-dominated Roman villas of the Sussex Downs were inhabited by people who chose to surround themselves with animals to which their neighbours also chose.

The analysis of quantification data has so far provided a spatial dimension to the landscape of people and their livestock in this period and although there are indications that the localised aspect to farming and pastoral lives are evident, these were fluid and changed over time on a number of scales as with the pastoral shepherding communities of the central Hampshire downland or the wider economic developments in the Upper Thames and Severn Valley/Cotswolds area. Human-animal-landscape relationships were clearly multifaceted in Iron Age and Roman Britain. The analysis of quantification data has so far provided a spatial dimension to the landscape of people and their livestock in this period and although there are indications that the localised aspect to farming and pastoral lives are evident these were fluid and changed over time on a number of scales as with the pastoral shepherding communities of the central Hampshire downland or the wider economic and religious development of the Upper Thames and Severn Valley/Cotswolds area. The position of each site within the landscape and their proximity to each other would have helped shape the orientation of the landscape for the people living within each area. Social groups used farming as a method for constructing and maintaining social relationships, while using the visual landscape allowed groups to engage in larger perceived communities (*cf.* Moore 2007).

However, it is only when the quantification data are integrated with the ageing data that we get a better idea of how people and animals were moved through and engaged with other people in their landscapes. The killing of animals at younger ages suggests the practice of keeping flocks for a range of products at small rural sites; meat, dairy and wool. This is a necessity for many modern pastoralists who live on small farms, who use the products to trade and exchange between them and other groups in particular regions (Blench 2004, 32-35). There is evidence that some sites in the Hampshire Downs began to diversify their herd structures from middle Iron Age patterns, which was clearly sheep/goat-dominated across the region to several sites which had an increased frequency of cattle. Some pastoralists continued to herd flocks of sheep, whilst other sites may have increased in agricultural practices. If this was the case then pastoralists depending on milk products could use them both for consumption and to trade with adjacent farmers to acquire grain and other food. This would suggest that the manner and distance which people travelled across the Downs had begun to alter from the mid-late Iron Age. Increased agricultural production would have also begun to alter the aesthetic nature of the landscape.

There has been much speculation that the methods of animal management entailed a need for people to move between different sites for the reproductive needs of their livestock, both areas such as the Upper Thames Valley (Jones 1986, 111) and for areas of the Hampshire Downland with the indication that some sites were only temporarily inhabited as a result (Fasham 1987; Hill 1995, 86). The ageing data indicates that not all sites in these areas kept breeding herds. In order to keep the productive nature of these flocks sustainable, the movement of flocks around the landscape to be interbred with others is more likely. It shows that some people, instead of living everyday on specific settlements, were continually travelling through the landscape. They would have spent most of their lives within the valley, travelling between pasture and water, and meeting other groups periodically.

The presence of neonatal animals at banjo enclosures, such Micheldever Wood, indicates that animal breeding may have taken place at selected, specially enclosed sites which could be used at specific times of the year. This implies a situation where periodic gatherings of people and animals took place at particular sites especially for the covering of females, but possibly also for the birth of the young (*cf.* Fitzpatrick 1997, 75). At Suddern Farm, the large majority of cattle were bulls (Hamilton 2000, 185), possibly indicating a separation in the breeding stock. This is a common system in many pastoral regimes where males are kept separate after weaning (Bouissou *et al.* 2001, 120). The controlled breeding of livestock is variable in modern pastoral societies as different groups take different approaches and attitudes towards breeding (Blench 2004, 26). The Iron Age data provides some indication that breeding and reproduction was controlled and involved co-operation between different groups of people.

The role of Danebury as a seasonal breeding centre enables dispersed parts of the population to congregate (Grant 1984, 109; Stopford 1987). Whilst these sites are commonly seen as central places (Cunliffe 1994), as people and animals were moving towards them on a regular basis, they must not be seen as consumer sites in the way we think of towns. Rather animals were brought in as part of a regenerative cycle. The emphasis was on reproducing rather than destroying animals. In the way that people imagined time, this has a fundamental effect on the perception of the landscape. Instead of a linear rural/production to urban/consumption relationship, hillfort and banjo enclosures, in my opinion, were places where relationships human/human, human/animal were regenerated and so were pivotal in Iron Age space and time for the well-being of communities. This also exemplifies the importance and closeness between people and their livestock. Cattle and sheep were not bred to be killed. They were bred and herded to be kept alive as an integral part of society.

Wilson (1983, 190-191) has argued that an increase in herd sizes and arable production caused a reduction in the availability of pastoral land in the Upper Thames Valley, and that this led to an increase in the exchange of materials, animals and animal products between sites. Because the bone distributions appear similar between localised sites in the later Iron Age, the evidence suggests that livestock were being herded around the landscape on a communal basis. This situation has implications for linking people on different settlements into their surrounding landscape. The territories of the herds would have increased and by walking through the topography of traditional grazing grounds, local groups could identify with each other by familiarity of landscape and cultural practice (Lorimer 2006, 515). The act of moving with animals from different communities would have been consolidated through a shared perception of landscape.

The lowland plain of the Upper Thames Valley includes dense clusters of quite dispersed populations a pattern which seems to have been common in watery areas during the late Iron Age (Miles 1982; Taylor 2007). Hill (2007) has suggested that such areas were home to transhumant populations of people and animals moving from settlement to settlement. If this is true, then cattle exchange may have been an important method of social diplomacy. As demonstrated earlier, the use of cattle as bridewealth is common in many societies, a good example being the Nuer and Dinka groups in southern Sudan. As Evans-Pritchard (1951, 89) states: 'A man who receives only one cow of the bridewealth has in it the promise of a herd'. Here cattle are used in gift exchange to generate links between the two communities (Burton 1981, 157-159). In these occasions communities could come together to cement such ties, usually in spaces in between denser settlements so that social ties can be negotiated and where identities may be altered or maintained. Such events have been shown to take place in the Iron Age where evidence of gatherings and feasting is indicated at significant places in the landscape (Hill 1995). This notion is reinforced somewhat by the suggestion from Mattingley (2006, 393) that this area in particular seems to have been a liminal zones between Iron Age polities. As seen in the previous chapter, the age profile for cattle in the Upper Thames Valley during the late Iron Age indicates that animals were killed mainly for meat as opposed to other products. This does not mean that this was a meat-producing economy. This is unlikely where people-livestock relationships were closely entwined as is indicated by modern pastoral societies (*cf.*Abbink 2003). Rather animals could be used as a means of inter-group negotiation.

As archaeologists we tend to forget that these close relationships with livestock and the continual movement through the landscape would have been animated by the sights and sounds of the landscape as they journeyed from place to the next. The use of song by many non-western societies is a method of making place in the world. Ivarsdotter (2002) describes how the forests in Scandinavia resound with women's herding calls as they walk with their cattle and goats. These sounds mix with the noise of the surrounding landscape, the rustle of the wind in the trees, the bubbling of streams, and the birdsong combine. In this context the herding of animals through the landscape is perceived as an 'all-day musical event, where the singing was varied according to the different situations occurring in the course of the herding' (*ibid.*). Both people and animals respond to the calls of each other. Domesticates are not simply 'livestock' but members of the family, and given individual names to which they reacted.

If we apply this to the Iron Age in Southern Britain, the landscape could have been structured by the movements, interactions and sounds generated between people and their animals. Actions such as story-telling and songs place memories within the landscape, naming different parts of it. Suri men sing songs about their cattle and their personal relationship with them which describe their movement through the landscape but also to distinguish their regional identity (Abbink 2003, 349). The continuation of sheep husbandry in these regions must have taken place on a family-oriented scale, with knowledge of the animals and the movements through the landscape being passed down through many generations. This suggests that environment and economy do not determine the actions of society but are a culturally-interwoven part of it. There is certainly ample ethnographic evidence of people and animals travelling together, with the different interactions between them enabling meaning to be applied to places (Abbink 2003; Lorimer 2006).

However, there is evidence to suggest that the pattern of Iron Age production and supply altered in the south prior to the Roman period. The development of non-hillfort oppida into the late Iron Age as 'central places', has been argued to signify a change in political circumstance and the rise of unified kingdoms (Hill 2007, 31). Oppida tended to involve the enclosure of very large tracts of land defined by complex dyke systems (Figure 177). These represent a dividing up and enclosing of the landscape and, if these were areas where livestock grazing took place, may suggest a new method for animal production and rearing in the late Iron Age compared to the middle Iron Age. The late Iron Age phases at Silchester, Skeleton Green and Braughing each produced assemblages with cattle predominating and pigs remains as the second most abundant. If the view that these were still prestige animals then a concentration on cattle and pigs within visibly large and bounded areas would have demonstrated greater power for those who controlled the areas. The role of livestock at oppidum could come to signify the accumulation of wealth and a unifying of communities. The ageing data for cattle is clearly very different at Silchester to that at Danebury. The situations at Iron Age hillforts and late Iron Age oppida seem to have been very different (Figure 176). Cattle were present at the hillfort mostly as young animals. At Silchester, however, the opposite is true. If Danebury was a place of breeding and regeneration, the Silchester assemblage was devoid of young animals indicating that breeding took place elsewhere and cattle were being supplied to the site.

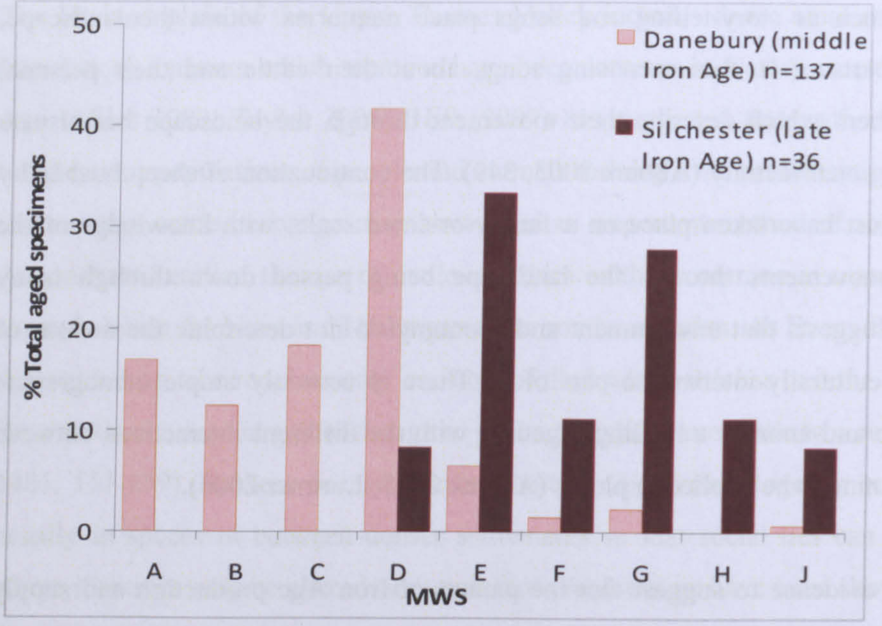


Figure 176; Percentage of cattle mandibles by wear stage from Danebury and Silchester (data from Grant 1991 and Grant 2000).

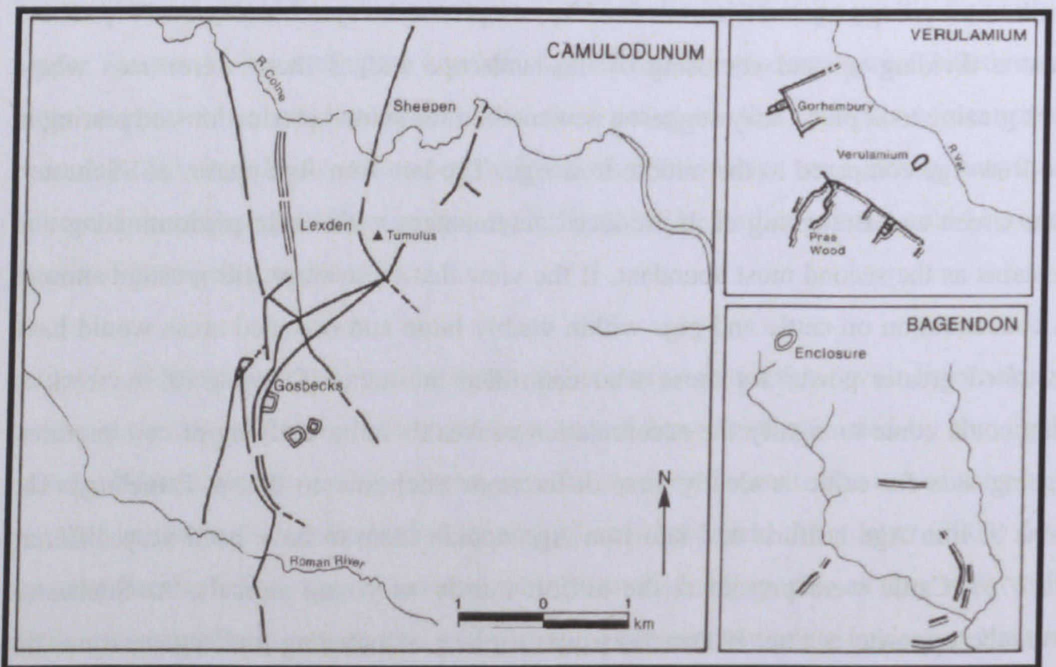


Figure 177; Plans of British oppida at Bagendon, Verulamium St Albans, Camoludunum Colchester (after Millet 1990, 26).

The implications of this are that the developing elite groups in the Iron Age were far less involved with the production of their animals. With the development of elite society in the late Iron Age there seems to have been an increasing social distance between them, other people and animals. We could take this separation in practice as a marker for status as seen in some non-western pastoral societies (*cf.* Parkes 1992; Robbins 1998, 224-225). The general pattern is one of elite groups not being involved in the main processes involved with rearing and raising livestock and only coming into the relationship at the point of death and consumption. Lower status families and wider groups were spending much more time with their animals, whether it be sheep and goats as part of large-scale pastoral practices or smaller-scale cattle rearing these people, a large proportion of the population, were spending many years with animals developing and maintaining close, strong emotional links with their animals. A similar situation is described by Robbins (1998, 224) of the elite groups in Northern India who eat cattle, sheep, goat and fowl without regard for the care of the animal ideology which contrasts with the rural peasantry who herd those animals. The elites perceive the practice of animal handling as 'ignoble, dirty and impure' (*ibid.*). To the herders however, the animals are sacred and rarely slaughtered. The continual maintenance of the herd is vital to the well-being of the community.

Humans are territorial animals. The breeding and rearing of animals not only took place on particular settlements but they came to define certain spaces becoming important events when mating and exchanging animals was appropriate. The boundaries between different groups became, temporarily, dissolved. However, as the character of the ruling elites developed, this mostly likely leaves us with a situation, prior to the Roman period where animal production and supply and the control of this resource, a pattern which is reflected by the increased marking of boundaries in the landscape, and around oppida in particular. The control and distribution of livestock was importantly metaphorical and physically parallel to the control and distribution of land.

5.4 Summary

The aim of this chapter has been to observe and analyse basic faunal remains data from a perspective which places the bones and the information they provide back into a 'landscape' setting. By re-engaging the remains with a sense of space on a scale beyond the site-based level we can achieve greater resolution as to how farming communities where living and moving within their local environment and, importantly recognising that sites do not exist in isolation. This now moves towards another level of analysis which is not simply different in scale but also in dimension. Rather than simply viewing physical space there is also a need to understand landscape at the cosmological level.

Chapter 6: Cosmological Landscapes: the realms of 'Nature' and 'Religion'

In the last two chapters I have considered landscape at different physical scales but, of course, landscape is not only physical: it is psychological; constructed according to cultures, beliefs and attitudes towards the natural world. Nature is commonly considered by anthropologists as being a socio-cultural creation, a place waiting to be given shape and meaning by the human mind (Sahlins 1976, 210). As an ideological phenomenon, religion has been shown repeatedly to be an important component in the visualisation of nature (Hayes and Marangudakis 2001; Sherkat and Ellison 2007). Cross-culturally, animals are central to human understanding of both the natural world and religious ideology (Thomas 1983, 301; Ritvo 1987; papers in Descola and Palsson 1996; papers in Selin and Kalland 2003; Pluskowksi 2010). As such, we can gain insights into past perceptions of the natural world – psychological landscapes and environments – by considering the archaeological evidence pertaining to human-animal relationships. It is on this premise that I set out to explore how, if at all, worldviews changed between the Iron Age and Roman period.

There are numerous works that examine past attitudes to nature and religion but most focus on the Roman world, particularly as experienced in the Mediterranean. For instance, Beagon's (1992; 1996; 2005) research has sought to understand the place of humanity in the Roman world through examination of Pliny the Elder's *Historia Naturalis*, a text which reveals people as central to the natural world with its wonders and phenomena circumferentially vibrating for the pleasure of civilisation. People, nature and the divine were intertwined parts of the same world; an act by one had an undeniable affect on the other (Beagon 1992, 32). Purcell (1987; 1994; 1996) has long examined the 'Roman' tendency for manipulating natural places and features for the benefit of human habitation. His work pays closer attention to archaeological evidence whilst remaining heavily influenced by the literature. It is clear from iconographic evidence that Roman attitudes to nature were articulated in their imagery of animals: there are many depictions of animals being hunted, fowled, or fished (Toynbee 1973). Just as common are the frescos and mosaics which celebrate the lives of birds, wild and domesticated mammals, in gardens, woodland, and farmland (*ibid.*). This imagery is paralleled in Roman literature, for example in Virgillian epics and the poems of Catullus, which combine the interplay between people and animals as expressions of religious thought (*cf.* Boyle 1986). Rogers (2008) is one archaeologist who has drawn on the concepts revealed by the historians and has focused attention not only on Britain (which is rare) but also on the Iron Age/Romano-British transition. Indeed, Rogers (*ibid.*) argues that late Iron Age oppida were positioned in watery landscapes because of the religious ideology and power associated with them. He showed that the development of many of these sites into towns in the Roman period continued to reflect the importance of these natural spaces because of the changing attitude towards their manipulation.

In general, Iron Age attitudes towards the natural world have received comparatively little scholastic attention by comparison to the Roman period, although there are some notable works. Barrett (1999), for instance, has argued that the mythical landscape of Iron Age Britain was a meaning-laden repository of settlements and monuments that sat alongside natural features, where personal experience of the world was tied to those places as reference points by notions of ancestry and group history. There was no culture/nature divide. The view that people are separate from nature is a general tenet of the modern western world (Ingold 2000, 40-41). However, the idea that animals formed a medium through which people could relate to prehistoric landscapes is becoming more widely accepted (Tilley 1994, 206; Jones 1998, 315). Studies by Green (1992; 2004) have suggested that all parts of the landscape were associated with religious thought and myth during the Iron Age (see also Bell 1995, 145). Again the work of Hill (1995, 111) is useful here because it has shown that the deposition of animals, in terms of how and where they were buried, did not conform to simple waste disposal but included meanings which tied them to concerns about everyday life, such as the agricultural cycle (see also Chapter 4). People were as much a part of nature as everything else. Iconographic depictions have preserved some of these thoughts about nature and religion for us to view. Again, Green's (1992) research on animals in the Iron Age is consistently supplemented by the observance of metalwork, pottery and coinage, whose images serve to demonstrate the interface between society and nature. Certainly, as Moore (2007) has argued, material cultures must be considered in any study of cosmological landscapes.

It is important to point out that the majority of the studies above have focused on either the Iron Age or the Roman period, with few crossing the boundary to inter-cultural comparisons. One exception is perhaps Creighton whose two volumes (2000; 2005) together explore both Iron Age and Roman Britain, touching on the worldviews of both. His work on the late Iron Age (2000, 14-18) highlighted the importance of horses in Iron Age cosmologies, demonstrating that an apparent increase in the use of horses into the late Iron Age was linked to horse imagery on coins which, Creighton argued, demonstrated the cosmological power held by these animals. However, he placed only minimal emphasis on the zooarchaeological data and in this chapter I will take an integrated approach to move analysis of Iron Age and Romano-British cosmologies forward.

Following Creighton's lead, this chapter begins by looking at the evidence for the use and perception of the horse in the Iron Age. My aim here is to examine the ways that horses were treated in the Iron Age in terms of how they were incorporated into the landscape through imagery, burial and physical movement. To engage with this issue further, and to set up the framework for the next chapter on Imperial landscapes, this chapter will end with a discussion of hunting, fowling and fishing. Reviewing of the evidence from Iron Age and Roman Britain I seek to evaluate whether such changes took place across the transition.

6.1 Human-Horse-Landscapes

There is, perhaps, no better example of the expression of human-animal-landscape relationships than the Uffington White Horse (Figure 178). Recent analysis has dated its origins to the late Bronze Age (Miles and Palmer 1995, 372-378), a period when horses were still relative newcomers to Britain. Current evidence suggests that horses were imported to Britain sometime in the late Neolithic/early Bronze Age and remained rare until the Iron Age (Clutton-Brock and Burleigh 1991; Yalden 1999; Bendrey 2010, 12). Horses were unlike any other of Britain's native fauna in that they permitted humans to travel distances at speeds previously impossible. As a result they probably embodied an extraordinary position in the minds of those who were unfamiliar with them. Helms (1993, 7) has shown that traditional societies tend to associate things which derive from remote places with tremendous supernatural power, a sense which is often linked to ancestry.

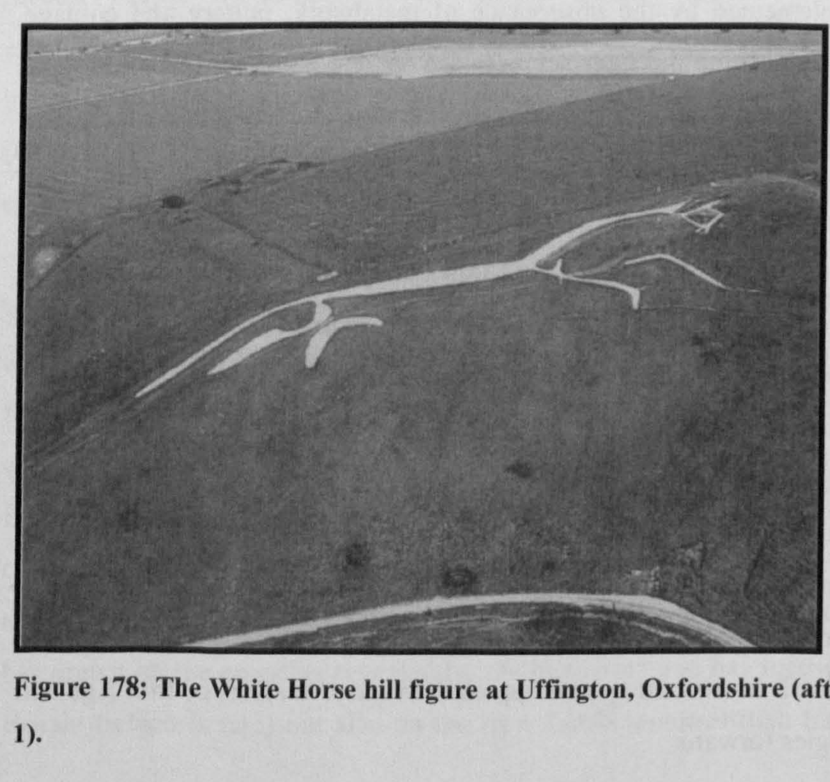


Figure 178; The White Horse hill figure at Uffington, Oxfordshire (after Schwyzer 1999, 43, fig. 1).

Our knowledge of the origin myths of Iron Age Britons is sparse at best but Green (1993, 8-14) interprets the many depictions of horses on coins (particularly those associated with the sun and chariot wheels) as mythological histories where Iron Age artistry is representing a divine event, possibly representative of a solar cult or sun god (Figure 179; Green 1992, 46). It seems possible that, by the Iron Age, horses had indeed become part of society's origin myths, as is found in other modern horse cultures: for instance, the Sakha of north-eastern Siberia believe that humans were created through a union between horses and centaurs (Crate 2008, 117). Certainly, Gosden and Lock (1998, 8-11) argued that settlement at Uffington had become discontinuous by the Iron Age, which led them to believe that the genealogical histories people associated with the site had shortened, a situation which would have provided considerable scope for myth relating to the White Horse to develop. Whilst daily habitation at Uffington declined in the Iron Age, the figure seems to have retained significance, indicated by the fact that it was maintained through continual scouring, weeding and cleaning at least once, if not more, every generation since its inception (Miles and Palmer *op. cit.*). Placing animals on the landscape, inscribing marks in its surface, is an important set of actions which grounds people, animals and their identities to a place and enables the development of histories; peoples' perception of their past. The combination of constructing social history and the use of the cultural landscape is an important part in formalising group identity (*cf.* Barrett 1999).

Figure 179; Horse and Sun symbols on a late Iron Age coin from Midland England (from Green 1992, 157).

It has been shown repeatedly that social histories, which are often fused with religious beliefs, are created and perpetuated by the elite in an attempt to both maintain group identity but also to legitimise control over the group (e.g. Smith 1986). And if, as it seems, the horse had become an important cultural icon in the Iron Age, it stands to reason that the elite may have sought to align themselves with this animal that bought both cosmological and real world power (i.e. the ability to travel at speed). Certainly the horse features as one of the best represented animals in Iron Age coin art as demonstrated by Creighton (2000, 65-66) who argues that this relationship went hand-in-hand with high-status notions of power. However, we must examine how this association related to the distribution of horse remains on archaeological sites.

The relative frequency of horse remains on mid/late Iron Age sites in the Hampshire Downs suggests that their prominence was restricted to a few settlements. At Bury Hill, a hillfort in the Test Valley, the high proportion of horse remains seems significant when considering the faunal evidence is joined by quantities of horse fittings and riding gear also recovered from the site (Figure 180; Cunliffe 2000, 62-63). This evidence gives the impression that the use of horses was elite-controlled to some degree, but it is less certain whether elite groups controlled their breeding; indeed the evidence for this phenomenon is rare from Iron Age sites (*cf.* Bendrey 2010, 14-15). The general lack of neonatal horse remains on Iron Age sites led Harcourt (1979) to suggest that horses were not deliberately bred by people but instead were seasonally rounded up from feral herds and managed from these sites. Such a view has continued to find some support (Grant 1984, 521; Hamilton 2000). Indeed, Grant (*op cit.*) suggests that the prominence of male horses at Danebury argues against the presence of controlled breeding. However, more recent finds of perinatal horse remains on a few Iron Age sites indicates that controlled breeding may have taken place in some areas (Powell and Clarke 1996; Mulville and Levitan 2004, 472). Remains of an infant horse (*c.*1yr old) were recovered from an Iron Age pit at Bradley Hill, Somerset, (Everton 1981, 223), whilst Poole (2008) identified an unfused distal tibia from an individual less than 12 months old at Latton Lands in Wiltshire, from an Iron Age pit adjacent to a roundhouse. Older horses were absent from these latter sites suggesting that these infant horses were either captured or traded into the settlements. Bendrey *et al.*'s (2009) strontium isotope analysis of a horse molar derived from an individual at Rooksdown, Hampshire, suggests that the animal had been moved over considerable distances. Its isotopic signature suggests that, prior to becoming *c.*4.5 years old, the horse had lived as far away as Wales, Scotland or the continent (Bendrey *et al.* 2009, 148). It is important to note that Rooksdown also included a number of neonatal horse remains and may have been an important breeding site (Powell and Clarke 1996). In contrast, horse remains from Bury Hill gave signatures entirely made up of local animals (Bendrey *et al. op cit.*). These isotope results provide no information regarding the prospect of controlled breeding or exploitation of feral herds but it does show that horses were travelled many miles and the presence of young at some sites indicates that they may have held very high social value.

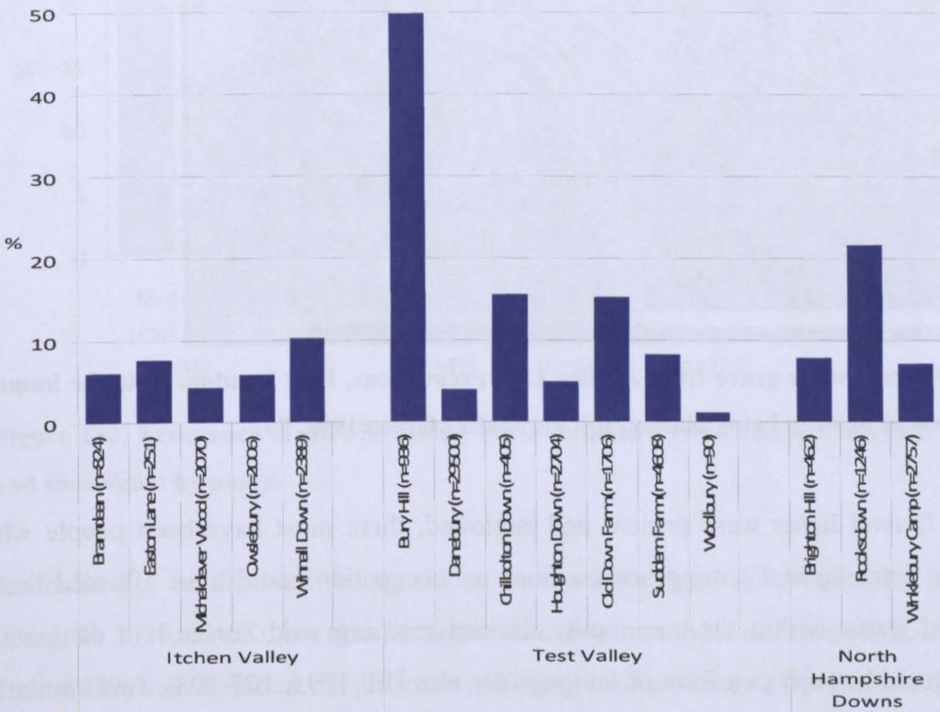


Figure 180; Proportions of horse remains at middle/late Iron Age sites within different areas of the Hampshire Downland. % given as the fragment count of horse against the total NISP of horse, cattle and sheep.

It is true that mating and selective rearing may have taken place on some Iron Age sites, and this would have been an incredibly compelling social practice due to its rarity. But, on balance, the evidence suggests to me that there may have been a mixture of the two situations – of selective breeding between small populations of already-domesticated horses with those from feral herds. If such a situation existed it may mean that some animals had incredibly close relationships with people through rearing, training and riding, whilst others had developed very little. The remains of horses from Gravelly Guy suggest that groups of individuals were treated in different ways. In particular, older animals were interred as associated bone groups whilst younger individuals were recovered from general waste deposits (Mulville and Levitan 2004, 472; see also Bendrey 2010, 15). If many horses, whilst clearly well cared for, – some embodying personhood (Figure 181) – still retained some notion that they derive from the wild, this separates them ideologically from cattle, sheep, goats and pigs, and situates them in a cosmologically separate place to those animals. Indeed, Hill (1995, 103-105) has previously argued, based on burial manners, that horses were categorised in a different way to other domesticates during the Iron Age.

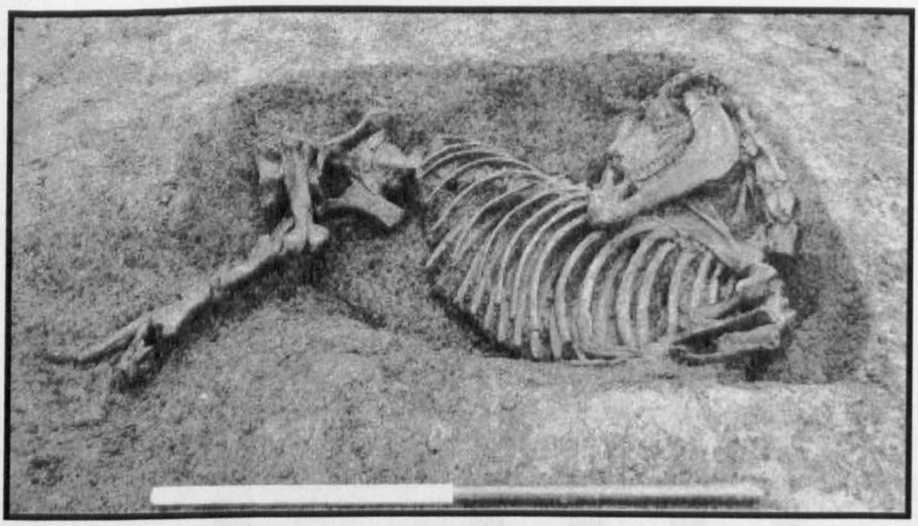


Figure 181; Human-horse grave from Jubilee Line excavations, East London. Note the human had been removed prior to being photograph here (after Green 1992, 99).

Importantly, if feral herds were present and exploited, there must have been people who specialised in catching and taming horses. Such an occupation could have afforded these people special status within the community. Indeed catching wild horses is a dangerous activity and could be seen as a form of *hunting* (see also Hill 1995, 107-108). And similarly to hunters, people with the abilities to catch and tame horses could be seen in shamanic terms (e.g. Helms 1993, 91-108; Wilerslev 2004). Regardless of the method of acquisition, the act of breaking and paddocking horses could psychologically demonstrate power over land, enhancing prestige by increasing the wealth of local communities. Mattingley (2006, 57) has suggested that the extensive ditch boundaries surrounding late Iron Age oppida were used for the controlled grazing of horses. Bendrey (2007; 2010, 16) has also highlighted that the horse enabled a more effective way of managing territory at a time when the landscape was being divided and political boundaries were becoming more important. It would seem likely then that the production of horses was closely tied to the elite and territory but, I would argue, also to cosmological power – something that would have been emphasised through the act of riding. Indeed the number of sites which include higher frequencies of horse remains continues to reduce from the Iron Age to the Roman period, indicating that their control and supply became more restricted and/or regulated over time (Figure 182).

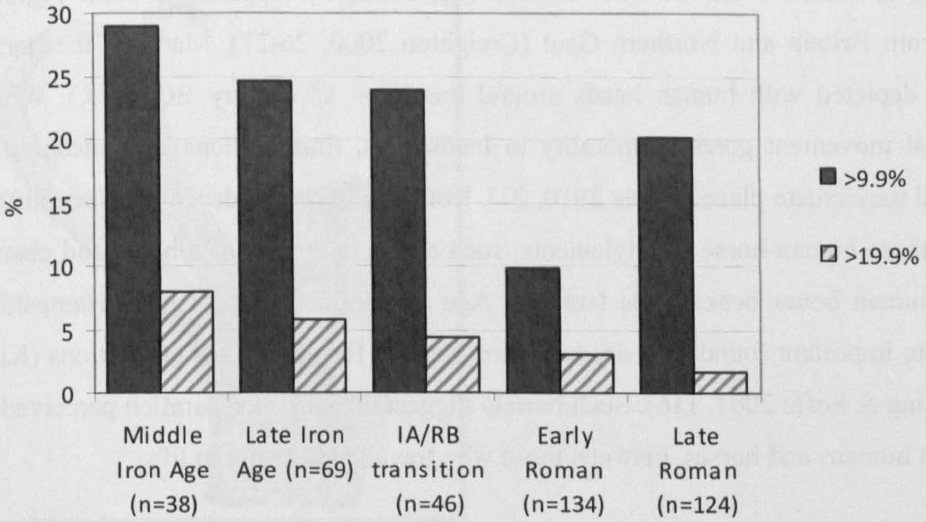


Figure 182; Frequency of sites including horse remains >9.9% and >19.9%NISP against cattle and sheep/goat by phase.

Undoubtedly, horses were being ridden in the Iron Age, as is indicated by riding gear (Cunliffe 2000, 62-63), but also through microscopic analysis of horse teeth. Bendrey (2007, 1045-1049) has identified the presence of bitting wear on lower 2nd premolars on horses from Danebury and Bury Hill. When long-distance travel was undertaken on a horse, people were revolutionising the dimensions of time and space by moving much further, much quicker (see also Bendrey 2010, 16). This could be seen as time-travel and the experience of riding at speed would affect the ways that people perceived the world around them. Iron Age coinage shows numerous depictions of horses and horse-riding against what Creighton (2000, 47-52) describes as trance imagery. This, Creighton (*ibid.* 48) contends, represents altered states of consciousness and feelings of weightlessness being displayed. Indeed, Game (2001, 2-3) describes in detail the experience of riding horses as producing similar psychological feelings of floating or flying. Durkheim (1976, 417) argues that riding produces religious feeling and a spirituality that is not present in ordinary human movement. Maybe this is the context that we should see riding in the Iron Age in that to ride, you are not simply 'human' but 'horse-human' and therefore experiencing the world in a different way. To think of 'human' and 'animal' as distinctly separated embodiments is a product of western worldviews (Ingold 2000, 48-50). Game's (2001) examination of riding experience emphasises the mutual becoming of human and horse. By riding, a person is crossing cosmological boundaries. When in ride, the horse and rider 'flow together, they are in tune with each other, rather like an orchestra. The relation is what matters here – individuals, human and horse, and species, are forgotten' (Game 2001, 4).

The mingling of human-horse identities on Iron Age coinage is apparent in some regional depictions from Britain and Northern Gaul (Creighton 2000, 26-27). Many of the horses begin to be depicted with human heads around the 2nd – 1st century BC (*ibid.*). Whilst human-animal movement gives temporality to landscapes, finite actions give meaning to space, indeed they create place (Sykes 2010, 21). Iron Age burial evidence provides further glimpses of these human-horse entanglements, such as the interment of a horse and chariot found with human bones beneath the late Iron Age shrine on Hayling Island, Hampshire, probably as an important foundation deposit memorialised for many later generations (King 2005, 339; King & Soffe 2001, 116). Such burials suggest the lack of separation perceived to exist between humans and horses, between those who travelled together in life.

6.2 The Wilderness in the Iron Age.

The lack of separation between humans and other animals is suggested in Iron Age art work which frequently shows a mixing of human and animal forms and is suggestive of shape-shifting. The idea that one creature could transform into another was not, however, restricted to humans, as there are many examples of animal to animal transformations, with horns being transposed onto non-horned species (Green 1992, 62-63; Ross 1996, 174-197). For instance, the existence of a second century BC horse mask, or pony-cap, from Scotland provides archaeological evidence that the transposition of horns or the shape-shifting of animals was formalised in the physical realm (Figure 183). These portrayals have a widespread distribution across the European Iron Age though were particularly prevalent in the north-west, in Britain, Denmark, and Gaul (Ross *ibid.*). The representation of horned animals seems to coincide with anthropomorphic deities and the horned god Cernunnos in particular, of which there are many representations from Iron Age Britain (Green *ibid.*; Ross 1996, 180-185).

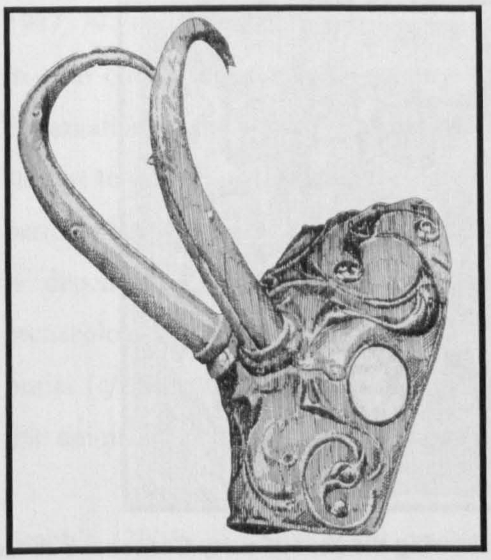


Figure 183; Bronze horned pony-cap from Torrs Farm, Kelton, dated to the 2nd century BC (from Green 1992, 135).

The most famous depiction of Cernunnos comes from the Gundestrup cauldron, a large gilt silver bowl from Jutland, Denmark, dating to the 2nd/1st century BC (Figure 184). Green (1992, 149) argues that the Cauldron depicts 'a complicated mythological narrative, perhaps an epic of creation'. It is quite clear from the imagery that a large range of animals held a level of importance in such stories, as Green puts it: 'a veritable zoo' (*ibid.*). Some scholars have chosen to recognize Cernunnos as the 'Lord of Nature' as holding conceptual power over the rest of creation (Green 1992, 148; Ross 1996, 182-183). Ross (*ibid.*), for example, bases her interpretation for this with analogy to Buddhist art design from India. If the Gundestrup Cauldron imagery does depict an Iron Age creation myth it would seem that humanity, as represented by Cernunnos, sits (literally) within the natural world and holds an equivalent place amongst the other animals which fill the cosmological landscape, whether real or imaginary.

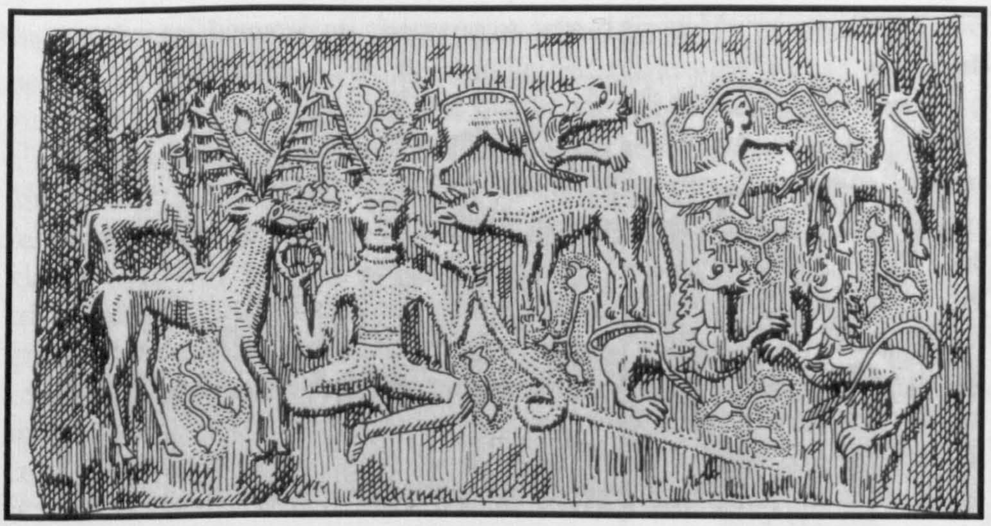


Figure 184; Inner plate from Gundestrup Cauldron, showing the horned deity Cernunnos as the 'Lord of the Animals' (from Green 1992, 148 – height of plate = c.20cm).

It is apparent that people are not set apart from animals within this rhetorical landscape, although an important transformation in environmental relations seems to have occurred. In effect the human has transformed. As Ingold (1990, 210) points out 'human beings, uniquely among animals, live a two-tier existence, half-in nature and half-out, both as organisms with bodies and as persons with minds.' The qualities represented by the first inner plate of the Gundestrup Cauldron shows the part of the human that remains 'in-nature' presenting itself as an amalgamation of animal characteristics (see Ingold 2000, 63). The animals here, those that we would recognize as 'wild', are participants in the world to which people also belong. They are not aiming to escape the hunters, to be seized by their skill, but instead are part of the same environment or in Ingold's (2000, 69) words: 'to establish a working basis for mutuality and coexistence.' Only once amicable relations between people and animals have been reached does the animal willingly allow itself to be taken. This is normally embodied by 'the kill', an event which is taken as proof of the good relations between human and animal but which is perceived, at least in hunter-gatherer societies, to be a non-violent act (*ibid.*). Indeed, there is no depiction of any hunt on the Gundestrup Cauldron; no dramatic illustration celebrating the *technical* ability of humans and dominance over nature. In this sense the killing of animals, such as the stag which was held to be an *important* animal in the Iron Age worldview as attested by their place in artwork and from the value of horns/antler, was instead a statement of amicable relations rather than human domination.

Burial practices can be a good indicator of people's worldviews which extend beyond the physical (Metcalf and Huntington 1991). Grouped inhumations or cemeteries are a rarity in Iron Age Britain with the majority of people being individually buried in pits whole or as disarticulated remains (Cunliffe 1991, 508; Hill 1995; Carr and Knusel 1997; Fitzpatrick

1997, 79-80; Madgwick 2008). Formal inhumations only become more common, particularly in elite circles, from the 1st century BC onwards (Whimster 1981; Cunliffe 1991, 505). Excarnation is the socially-sanctioned removal of body parts from a place of temporary storage to a place of final burial (Metcalf and Huntington 1991, 97). This normally follows a period when the remains are left out to undergo stages of decay. The length of time this takes is dependent on community ideology and individual practice. Despite the range of archaeological and anthropological literature which focuses upon excarnation and secondary burial (*cf.* Schroeder 2001; Weiss-Krejci 2001; 2005; Beck 2005; Cheniér 2009), the part that animals sometimes play in the process has received comparatively little attention.

Smith's (2006, 683-684) work on Neolithic human remains has suggested that animals probably had a deliberate role in excarnating remains by 'cleaning' the body before final deposition. Walker (1984) has suggested from gnawing marks on disarticulated human bones at Danebury that bodies were left out and made accessible to foxes. Madgwick's (2008) more recent reanalysis of the human bone from Danebury has shown that, overall, canid gnawing was relatively infrequent and that the use of platforms restricted access to carnivorous mammals. Four-poster platforms have been excavated at Danebury and other hillforts, though excarnation could have taken place in a variety of natural features, such as trees (Carr and Knüsel 1997, 168). In such instances, scavenging birds, corvids in particular may have had a greater involvement (Carr and Knüsel 1997, 170; Madgwick 2008). The relative frequency of crow/rook/raven remains tends to be slightly higher on Iron Age nucleated sites compared to non-nucleated and Romano-British sites (other than early Roman towns - Figure 185). Similarly, raven remains occur relatively frequently on middle Iron Age nucleated sites showing a pattern which is only matched by high frequencies on urban and military sites of Roman date (Figure 186). Certainly crows, rooks and ravens were interred in relatively high frequencies as associated bone groups at Danebury suggesting that their burial was deemed to be appropriate at these sites (Serjeantson 1991; Poole 2005). Other Iron Age sites also show similar signs of deliberate burials of corvids, such as at Rooksdown, Dragonby, Winklebury Camp, Suddern Farm and Balksbury Camp, each of which are either nucleated or extensively enclosed. Foxes are similarly found interred as whole or partial bone groups on hillfort sites such as Danebury and Winklebury camp. The latter also included a number of complete badger skeletons in large pits (Jones 1977).

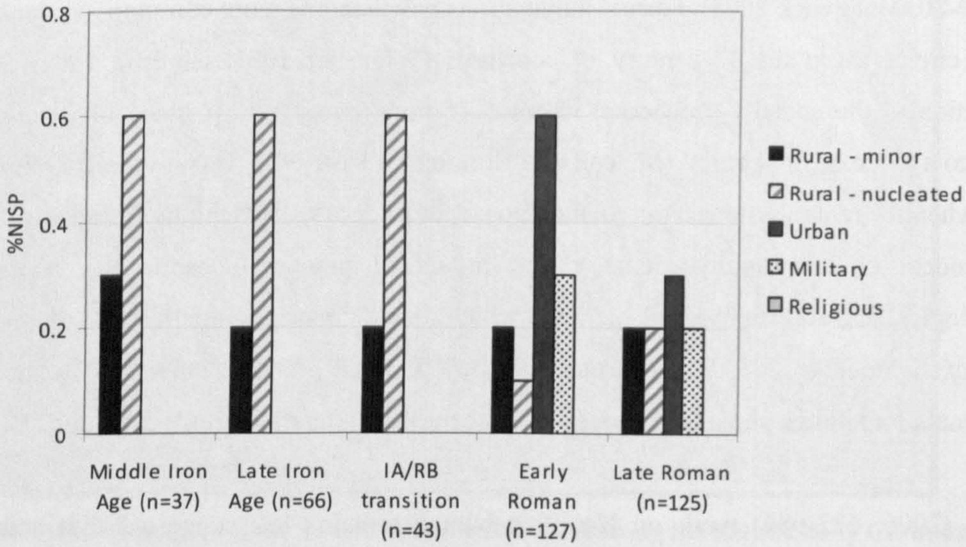


Figure 185; Relative frequency of crow/rook/raven remains against cattle and sheep/goat on sites by type and phase.

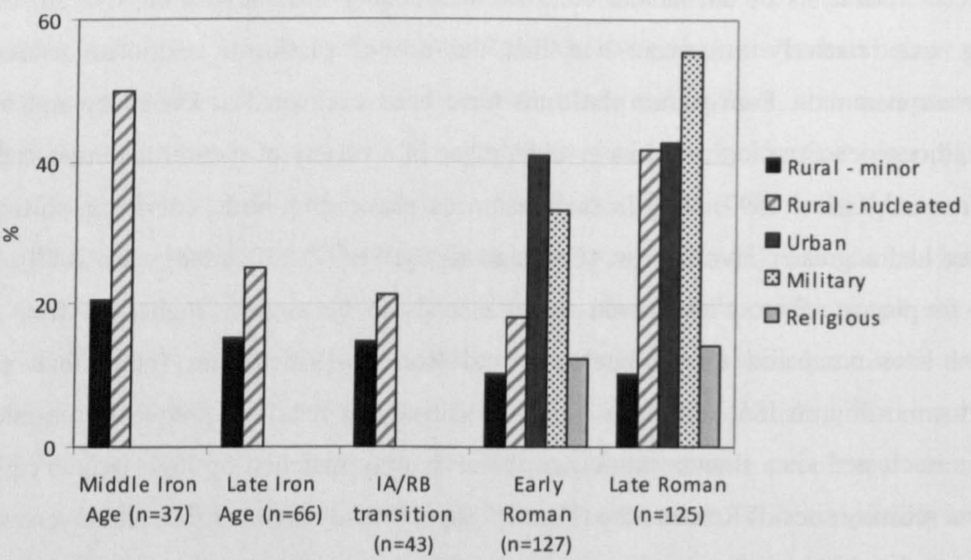


Figure 186; Representation by percentage occurrence of raven remains on sites by type and phase.

When left in this transitional stage of decomposition, the bodies are seen to inhabit a liminal space between life and death (Carr and Knüsel 1997, 167). In this sense they are left in the wilderness. The animals which engage with those bodies would thus also inhabit such a space. Green (1992, 126) suggests that 'ravens and crows, with their black plumage and their habit of feeding off dead things, were clearly seen as messengers from the Otherworld.' The idea that human bodies could be left out to be 'scavenged' by wild animals is interesting when we consider the general lack of wild animal exploitation during the Iron Age. The relative frequency of wild mammal and wild bird remains on Iron Age sites is minimal

(Figure 187). The same is also true of the Roman period, though the social context surrounding wild animal exploitation may have had a different meaning in the latter period as will be discussed further on.

King (1991, 17) suggested that a taboo surrounded the consumption of wild animals during the Iron Age. Isotopic analysis of human remains from the Iron Age site at Glastonbury Lake Village, a site where wetland fowl and fish remains were recovered in relative abundance, showed that signatures from aquatic resources were negligible or absent (Jay 2008). This suggests that even in places where fish and fowl were caught they were rarely eaten. Similarly Hill (1995, 104) argued that prohibitions surrounded hunting practices. The results of my wider analysis indicate that the exploitation of wild animals was indeed minimal during the Iron Age. Wild mammal remains on middle and late Iron Age sites tend to represent less than 2% of remains against cattle and sheep/goat, though middle Iron Age nucleated sites and late Iron Age religious sites record percentages slightly above this figure (Figure 188). Similarly, wild bird remains are also rare, though they are slightly better represented on late Iron Age compared to middle Iron Age sites (Figure 189). Fish also have previously been shown to have been widely avoided by the Iron Age population in Britain (Dobney and Ervynck 2007). Fish rarely occur on rural-minor sites, a pattern which continues from the Iron Age through the Roman period (Figure 190). In relative terms however, fish occur quite frequently on rural-nucleated sites. This may be in part due to the relatively small number of sites recorded in this category. However, four of the five middle Iron Age hillforts in my analysis - Conderton Camp (flatfish), Maiden Castle (trout), Danebury, and Winklebury Camp - each produced fish bones. These remains are generally restricted to one or two specimens, though the high frequency of occurrence is an unexpected anomaly. The presence of these animals at hillforts, in a world where fish were generally avoided, seems to further separate these sites from 'everyday activities' which were taking place elsewhere.

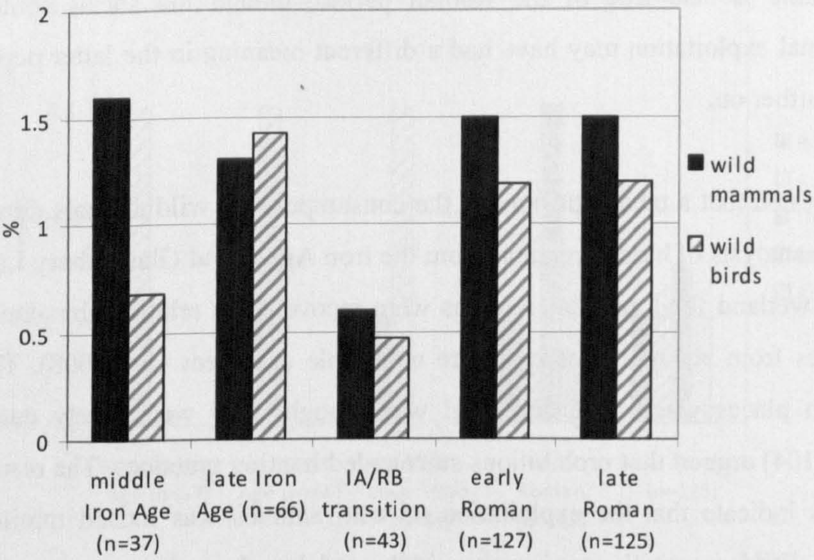


Figure 187; Relative frequencies of wild mammal and wild bird remains against cattle and sheep/goat on Iron Age and Roman sites by phase.

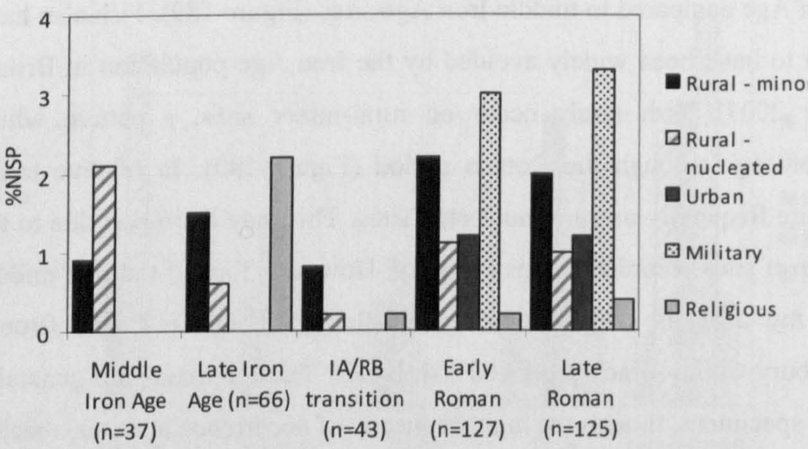


Figure 188; Relative frequencies of the main wild mammal species by site type and phase. Calculated against cattle and sheep/goat remains.

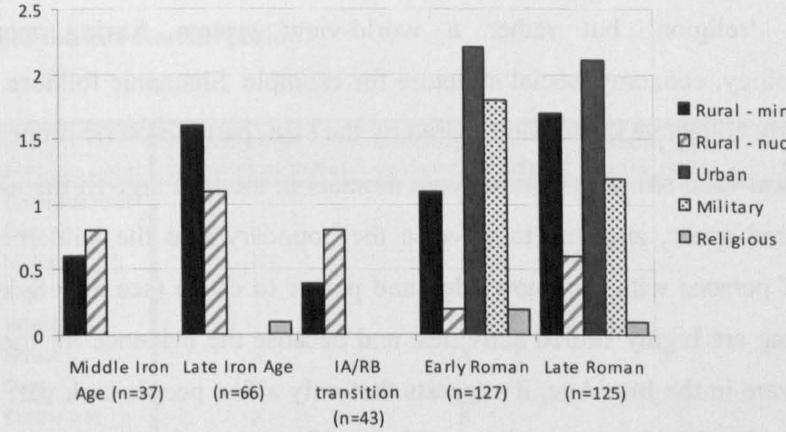


Figure 189; Relative frequencies of wild bird remains by site type and phase. Calculated against cattle and sheep/goat remains.

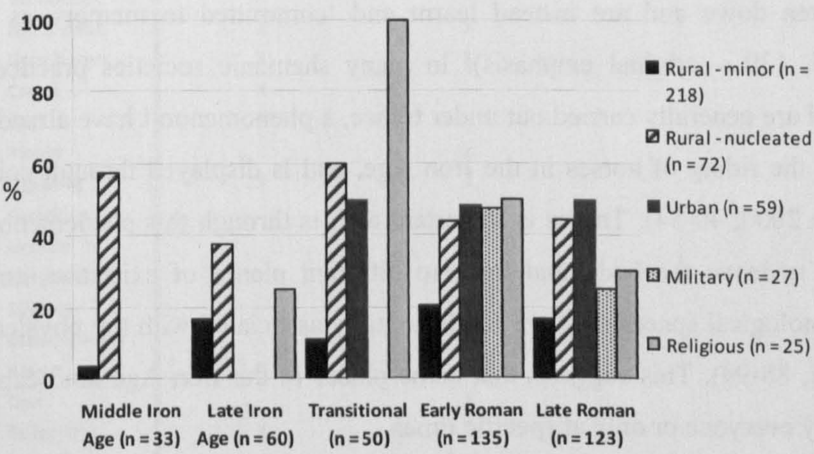


Figure 190; Representation of fish given as the percentage occurrence of remains on sites by phase and site type.

Overall the presence of wild animals on Iron Age sites is minimal and where they do exist they are generally as associated bone groups, and in many places they are associated with disarticulated human remains (Hill 1995). The enclosed nature of hillforts alongside practices being carried out within them, rather than representing 'central places' (see Cunliffe 1994), may in fact have marked them as liminal zones, linking the domestic sphere and other worlds. This provides further contextualisation to the Iron Age landscape suggesting that hillforts and similar places could provide a link between culturally-constructed worldviews and the essentiality of the material world through social practice (*cf.* Jordan 2001, 88).

There may have been an important link between sacred places, wild animals and the idea of shape-shifting. These have frequently shown to be important associations in shamanic societies (Williams 2001; 204-205; Wilerslev 2004). As Pentikainen (1998, 59) points out 'Shamanism is not a 'religion' but rather a world-view system...having many intercorrelations with ecology, economy, social structure for example. Shamanic folklore in shamanic societies is partly collective knowledge shared by the clan, partly esoteric property known only by the shaman.' The attitudes towards wild animals in the Iron Age fit the idea that the wild was a sacred space, and that to traverse the boundary into the wilderness required the existence of persons with the knowledge and power to do so (see also Sykes 2010). Hunting and fishing are highly skilled activities, and because the evidence for these practices was extremely rare in the Iron Age, it suggests that only a few people took part in them, providing those people with identities imbued with specific esoteric knowledge about the landscape. However, that knowledge had to be learnt and remembered because it was not written down in the Iron Age. Budd and Taylor suggest that, in non-literate societies, complex practices are ritualised by necessity because they involve a series of procedures which cannot be written down and are instead learnt and 'committed to memory as a formulaic *spell*' (1995, 139 – original emphasis). In many shamanic societies practices requiring *technical* skill are generally carried out under trance, a phenomenon I have already suggested existed with the riding of horses in the Iron Age, and is displayed through coin imagery (see Creighton 2000, 40-54). Trance is important as it is through this phenomenon that shamans are able to leave the body and traverse different planes of existence, and although these are cosmological spaces they are fundamentally associated with the physical landscape (Jordan 2001, 88-99). This suggests that some places in the Iron Age landscape could not be accessed by everyone or only at specific times.

There is a growing body of evidence which suggests that the deposition of votive offerings in natural features such as marshland and rivers was not restricted to fine metalwork during the Bronze and Iron Ages and, in fact, commonly involved the deposition of human and animal skulls and other bones (Prior 1992; Bradley 2000, 148). An exceptional assemblage of wild bird remains were identified from the site of Haddenham V, Cambridgeshire (Serjeantson 2006a). Compared to all other mid/late Iron Age sites, even those with good evidence for wild bird exploitation, Haddenham V includes a greater range of wildfowl species. Only Danebury produced a similar count of avian taxa (Table 45). However, when compared by relative frequencies of bird remains, the Haddenham V assemblage includes a considerably higher frequency of bird remains (Figure 191). It is also of note that this assemblage was devoid of domestic fowl remains. Bones of swan and mallard were particularly abundant and other large birds, such as common crane and pelicans, were also exploited (Serjeantson 1988; 2006). The site produced, as far as the author is aware, the only remains of pelican, goldeneye and goosander from English and Welsh sites dating between the middle Iron Age and the late Roman period.

Taxa	Haddenham V (Serjeantson 2006a)	Danebury (Serjeantson 1991)	Balksbury Camp (Maltby 1995)	Dragonby (Harman 1996)	Silchester (Serjeantson 2000)
Domestic fowl		X		X	X
Duck sp.	X	X			
Mallard	X	X	X	X	X
Teal	X				
Wigeon		X			
Goose	X	X	X	X	
Coot	X				
Cormorant	X	X			
Pelican	X				
Shoveller	X				
Pochard	X				
Tufted duck	X	X			
Goldeneye	X				
Goosander	X				
Woodcock	X	X			X
Mute swan	X	X			
Grey heron	X	X	X		
Crane	X				
Gull	X				
Plover		X			
Lapwing	X	X			
Partridge		X			
Grouse		X			
Thrush	X	X			
Sparrow		X			
Crow/Rook	X	X		X	
Raven	X	X	X	X	X
Owl		X			
Buzzard	X	X		X	
Red kite				X	
Sea eagle	X			X	
Goshawk				X	

Table 45; Table indicating the presence of bird species on selected mid/late Iron Age sites

Haddenham V was constructed with the watery landscape in mind. Water would have flowed through its ditches and drainage gullies (Figure 192). The Fenlands were lightly settled in the Iron Age compared to other areas of southern Britain, and Evans (1997, 225) has argued that this type of settlement existed within a quite separate Iron Age 'world system'. Indeed, marshland has commonly been referred to in the archaeological literature as a marginal or liminal space (*cf.* Van der Noort and O'Sullivan 2007, 83-84). If the exploitation of wild resources was carried out by shamans in the Iron Age then the site at Haddenham V, within its watery landscape and evidence of intensive wildfowling, would suggest a focus of such activity, placing the Fens in the 'Iron Age wilderness'.

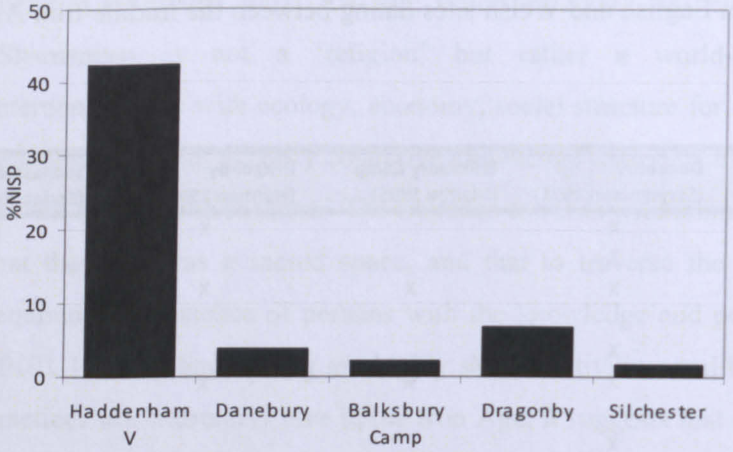


Figure 191; Relative frequency of bird remains from selected mid/late Iron Age sites. Note: domestic fowl are included in the calculations here, though their remains are absent from Haddenham V.

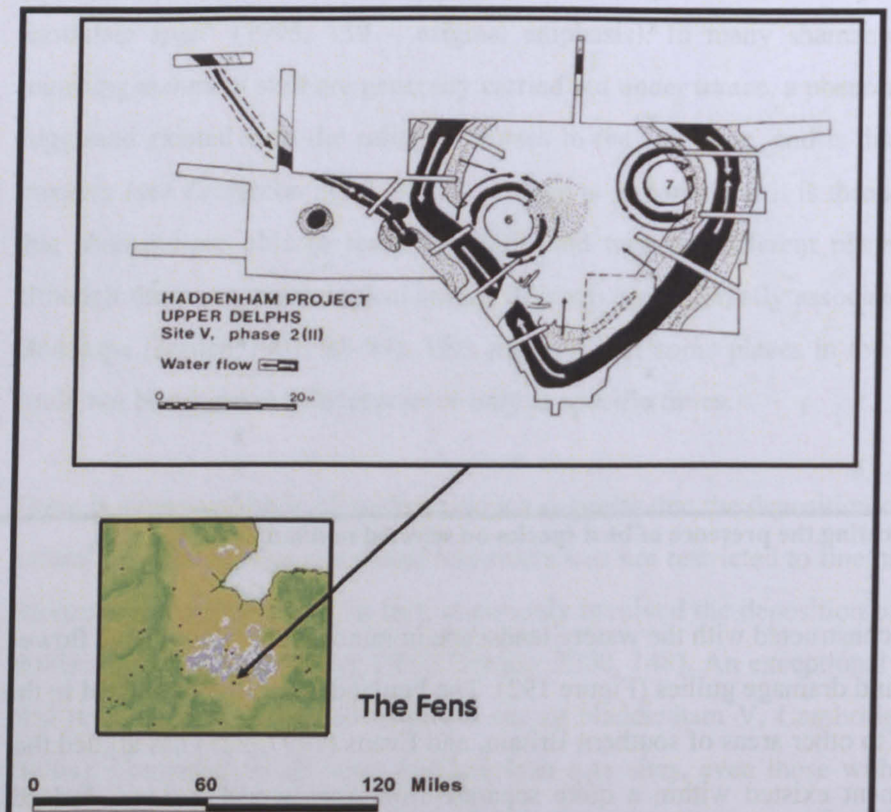


Figure 192; Location of Haddenham V, Cambridgeshire, in the Upper Delphs – note the projected flows of water on the plan (site plan after Evans 1997, fig.21.3).

Sites in the Fenlands would have been characterised by intense seasonality, none more so than in the movements of the migratory wetland birds which temporally inhabited the area. We may see the high frequency of bird remains at Haddenham V as an act of sharing in local resources at particular times of the year. As a place in the wilderness, Haddenham would still have been part of the wider landscape, connected to settlements on drier land by track and waterways. The site could have been visited by communities at times of seasonal change. A similar situation has been observed in Siberian Khanty society where sacred places are temporarily visited by local groups under the lead of the local shaman in remembrance of the dead, holding special feasts with foods outside the everyday fare (Jordan 2001, 97). Yukaghur hunters also practice similar seasonal actions (Willerslev 2007, 30). Seasonal hunting is important in these societies as it maintains a continual cycle of rebirth for both humans and animals. There are occasional instances of 'overhunting' of bird and mammal populations amongst similar modern cultures across Siberia, Greenland and Canada, which should not be seen as linked to modern commercial hunting but as a larger 'turnover' of life (*ibid.*). Willerslev (2007, 32) further explains that this cycle is a 'closed' system; life cannot be gained or lost but is constantly recycled between the world of the living and the dead. It is possible that the Haddenham evidence can be seen in this light. The construction of the site would have taken an extensive workforce, though the settlement was not large enough to allow such numbers of people to live there (Evans 1997; Evans and Hodder 2006). It could instead have been an important seasonal gathering-point for several groups of people in the surrounding area. In the forests of the Khanty, the animals which inhabit the area belong to the spirits of the place: 'In order to request community health, welfare and hunting success, these sites are visited at times in the seasonal cycle when the community has aggregated again or is about to disperse' (Jordan 2001, 96).

Site	County	Site Group	Date	NISP Beaver	Reference
Biddenham Loop	Bedfordshire	Rural - minor	MIA	1	Maltby 2008
Market Deeping	Lincolnshire	Rural - minor	M/LIA	3	Albarella 1997
Mingies Ditch	Oxfordshire	Rural - minor	350-100BC	2	Wilson 1983
Haddenham V	Cambridgeshire	Rural - minor	LIA	228	Serjeantson 2006a
Haddenham IV	Cambridgeshire	Religious	LIA	1	Higbee 2006
Orton Longueville	Cambridgeshire	Rural - minor	AD125-150/175	1	King 2001

Table 46; Finds of beaver, *Castor fiber*, from Iron Age and Roman sites in Britain.

Another animal which seems to have been intensively exploited at Haddenham is the beaver *Castor fiber*. This mammal was rarely exploited in Britain during the Iron Age and even less so in the Roman period. From the 6 sites in my dataset which produced beaver remains, five are in the Fens or on the Fen edge, and one, Mingies Ditch, is in the Upper Thames Valley (Table 46). As with the wildfowl, only Haddenham V seems to have produced an 'over-abundance' of beaver remains. Serjeanton's (2006a, 216-217) analysis have shown that certain body parts of the beaver, the femur and tibia in particular, are well represented whereas other parts are absent. Similar trends are seen in the bird assemblage where an overrepresentation of wing bones led Serjeantson (*ibid.* 246) to suggest that furs and feathers were locally traded. Another explanation, based once more on ethnographic evidence (*cf.* Jordan 2001, 100), could be that the initial butchery of the hunted animal took place at the kill site and that particular body parts were left *in situ* so that the ancestral spirits would know that it has deceased. The soul of the animal remains with those body parts and is left within the sacred environment. The idea that ancestral spirits aid and facilitate hunters in the wilderness is a cross-cultural phenomenon (see also Bird-David 1992; Kohler 2000, 57-58; Willerslev 2007, 131-132).

If these patterns of wild resource exploitation hold some truth in the ethnographic interpretation, it allows for the evidence to be moved away from an environmentally-determined explanation, i.e. wetland birds and beavers being killed and eaten simply because that was where they lived. At the same time, it also suggests the influence and agency of the local landscape on human perception of the environment; such that the landscape itself has an active role in shaping peoples beliefs, movements and actions. If hillforts offered communities in downland areas places of *sacred* sanctuary, then enclosures in marshland and woodland could also form similar functions.

One place long considered to have been sacred in the Iron Age and Roman period is Hayling Island (King and Soffe 2001; King 2005, 337). The focus of activity on Hayling Island comes from the imposition of a specifically religious site in the north of the island. Based on coin and contextual evidence, the site has two main phases (Briggs *et al.* 1992; King and Soffe *op cit.*): the first is late Iron Age, beginning around the mid-1st century AD and possibly extending over AD43, a period which included the development of a square timber enclosure surrounding a circular feature which, in turn, enclosed a large post-pit. This area has been suggested to be a shrine (King and Soffe *ibid.*). The second phase is characterised by substantial rebuilding of a large stone monument building which completely encased the earlier Iron Age shrine structures. The architecture of the building has clear affiliations with high-status temples in western Gaul and the site has been interpreted as such (*ibid.*).

Rather than being associated with a particular deity, Creighton (2000, 192-197) has argued, quite convincingly, that the site was associated with a dynastic cult relating to local ruling leaders during the late Iron Age phase. As mentioned previously, the early foundations of the site produced human bones from at least two individuals along with horse remains, chain mail, and riding furniture possibly relating to a chariot burial (King 2005, 337). The faunal remains, as shown in chapter 3, are dominated by sheep/goat and pig bones from both phases of activity. There were minimal remains of hare (7) and red deer (4) recovered from the earlier (IA) phase but were absent in the later (RB) phase (*ibid.*). Again the association of the wild with sacred places in the Iron Age is apparent. The link between Hayling Island and Haddenham is that at both sites water needed to be crossed for the site to be entered. It is wholly possible that such movement represented the crossing of conceptual boundaries. The ramparts of hillforts may also have acted in a similar way. Hunting metaphorically represents similar boundary crossing, as Helms (1993, 153) explains it 'is exemplative of that realm of uniquely human thought and expression that reaches beyond the limitations and restrictions of the domestic, the subsistence-orientated, the local, and the kin-based to relate human enquiry and experience to a wider realm that lies beyond.' Indeed, hunting in this sense is inherently linked with shamanism as it is one of the oldest modes of engaging with the outside domain (*ibid.*).

Towards the end of the Iron Age in Britain it is quite clear that greater contact with the continent takes place: there are increased levels of long-distance trade (Haselgrove 1982; Cunliffe 1988; Hill 2007). As noted, the religious site at Hayling Island takes on a completely new aesthetic, as do other similar sites such as Uley Bury (Woodward and Leach 1993) and Folly Lane (Niblett 1999). After redevelopment at Hayling Island, wild animals are no longer exploited and continental coinage dramatically increases compared to the Iron Age phase where native coin types predominated (Creighton 2000, 194-195). Contact with 'outside' realms may have changed in terms of what it meant to people, and in terms of spatial and temporal distance.

6.3 Resituating the Wild in the Roman Period

Literature and poetry clearly influenced the thoughts and ideas of many people in the Roman World. Virgil's *Georgics* was important for relating agriculture to peace and prosperity in the Empire (Boyle 1986, 85-91). Farmland is perceived here as the ideal and ordered domestic landscape scene. Throughout Virgil's work, cattle are consistently referred to as a primary feature of the landscape whether the narrative is talking positively about life and love or negatively about death and suffering. The link between human life, animals and the environment is continually stressed through the importance of labour, but is defined by religious belief.

> "And draughts of ether; for god, they say, pervades all
> Lands, and the ocean reaches and the deep sky;
> From him cattle, herds, men every tribe of beast
> Each at birth derive the subtle breath of life;
> To him indeed all things at last return and, dissolve,

Are taken back; no place for death, but alive they fly

To the ranks of stars and ascend the soaring heaven."

(Virgil, *Geor.* 4.221-227)

This parable suggests that the land, people and animals are parts of a divine/spiritual cycle which continually feeds its own regeneration. Cattle are central to this ideology and, with man, are not passive 'fixtures' in Nature's performance but are active agents. In this vision labour is not a necessity, ominous and essential for survival, but is instead viewed as the source of the 'civilised world' where Nature's resources are harnessed by society (Boyle 1986, 56). The poet Virgil viewed Italy as the arena of nature's ultimate beauty with its "joyous herds", "warhorses", "snowy flocks", and "the bull, that noblest victim" (*Geor.* 2, 136-176). If the historical sources suggest that the domestic ordered landscape was a religiously important realm it seems to have separated itself, in a sense, to the 'wild'.

As already noted, the relative frequencies of wild mammal and wild bird remains did not change overall on sites from the Iron Age to the Roman period. In terms of the frequency with which wild mammal species occur on sites, no major changes between the Iron Age and Roman period can be observed though more subtle shifts might be apparent (Figure 193 - Figure 197). There is slight evidence for an increase in the occurrence of roe deer on rural-minor sites from the Iron Age to Roman periods. Hare are very well represented on early Roman rural-minor sites compared to other phases. Red deer, roe deer, and hare, which are the main hunted species, tend to be best represented on urban and military sites in the Roman phases compared to the other site types; though this pattern is not universal. If this is a real pattern it would suggest that the exploitation of wild resources had shifted from occasional but important exchanges with the wilderness of the native landscape towards sites which held regional control and demonstrated Imperial power. As has been shown, the frequencies of wild species identified at Fishbourne are an excellent example of this. This is not an isolated case however. In urban areas, deposits of animal bone debris vary in species and element type by area depending on the cultural and economic divergence that existed therein (Maltby 1993, 339-40). Large-scale syntheses of data, such as this study, effectively mask the range of identities which existed in nucleated settlements. Luff (1993, 9) has clearly shown that, at Colchester *Camulodunum*, frequencies of wild mammal remains, roe deer in particular, differ considerably between areas, particularly those associated with the military. Comparison of animal bone assemblages from the high-status early Roman town house at Winchester Palace, Southwark (Reilly 2005, 160) against a more general assemblage from Roman Southwark (Ainsley 2002, 261) showed a difference of 15.5% to 0.5% wild mammal remains respectively.

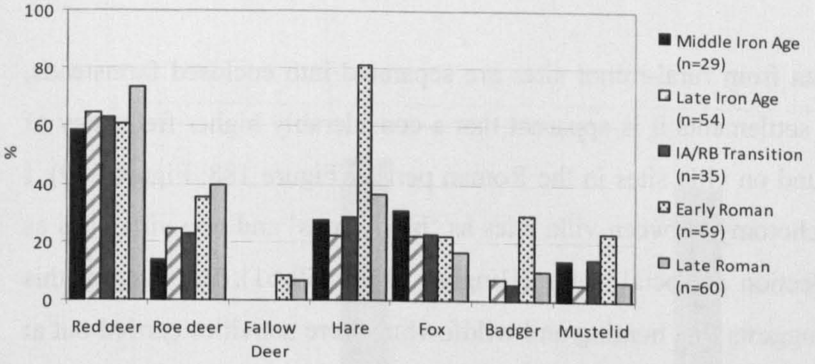


Figure 193; Inter-period variation in the occurrence of wild mammals on rural-minor sites

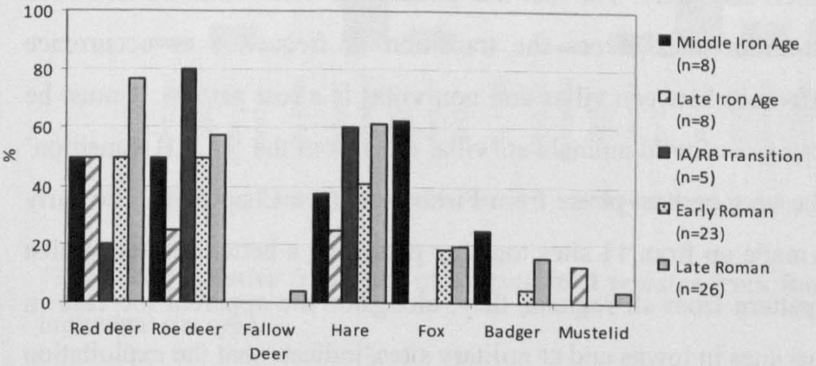


Figure 194; Inter-period variation in the occurrence of wild mammals on rural-nucleated sites

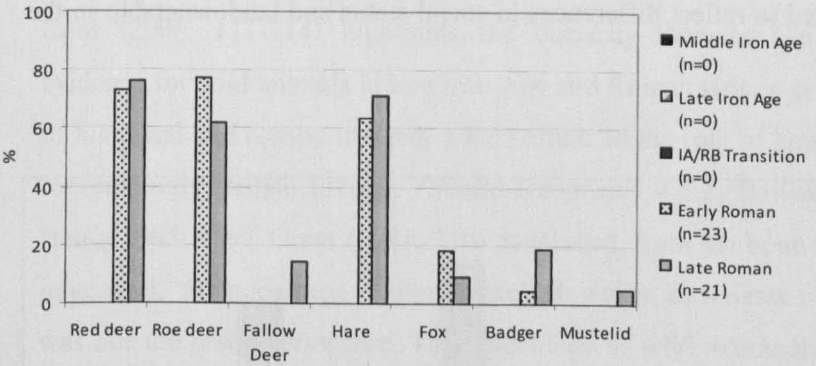


Figure 195; Inter-period variation in the occurrence of wild mammals on urban sites

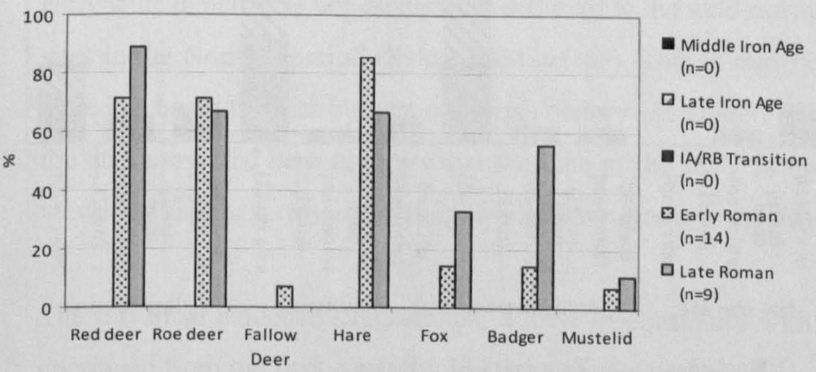


Figure 196; Inter-period variation in the occurrence of wild mammals on military sites

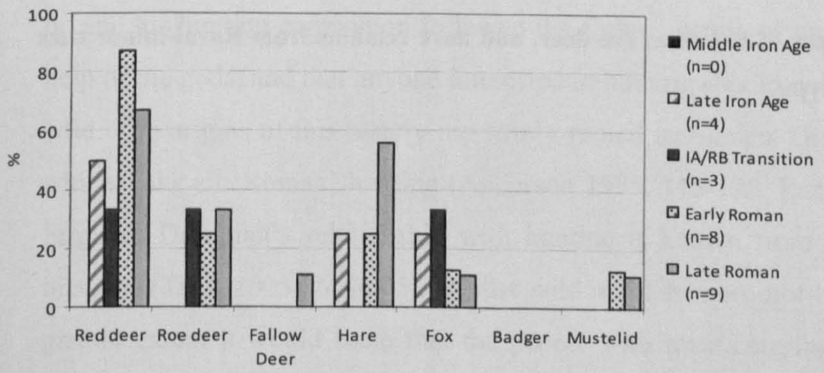


Figure 197; Inter-period variation in the occurrence of wild mammals on religious sites

When the wild species data from rural-minor sites are separated into enclosed farmsteads, open farmsteads and villa settlements it is apparent that a considerably higher frequency of wild animal remains is found on villa sites in the Roman period (Figure 188; Figure 189). I am well aware that the dichotomy between villa sites as 'high-status' and non-villa sites as 'low-status' is a poor reflection of social status (Hingley 1989, 159-61). But even at this crude level of analysis it suggests that hunting and wildfowling were activities carried out at villas but not widely practised elsewhere. The fact that patterns of wild mammals and birds does not change on rural-minor sites across the transition in frequency or occurrence suggests to me that the difference between villas and non-villas is a real pattern. It must be said here that the high frequency of wild animals at 'villa' sites from the 'IA/RB transition' phase derive solely from the very earliest phase from Fishbourne (see Chapter 3). The early Roman phase, however, is made up from 11 sites together providing a better dataset. Whilst these may not reflect the pattern from all regions, they, alongside the apparent increase in wild mammals at high-status sites in towns and at military sites, indicate that the exploitation of wild resources had shifted to reflect differences in social-status and landownership in the early Roman period.

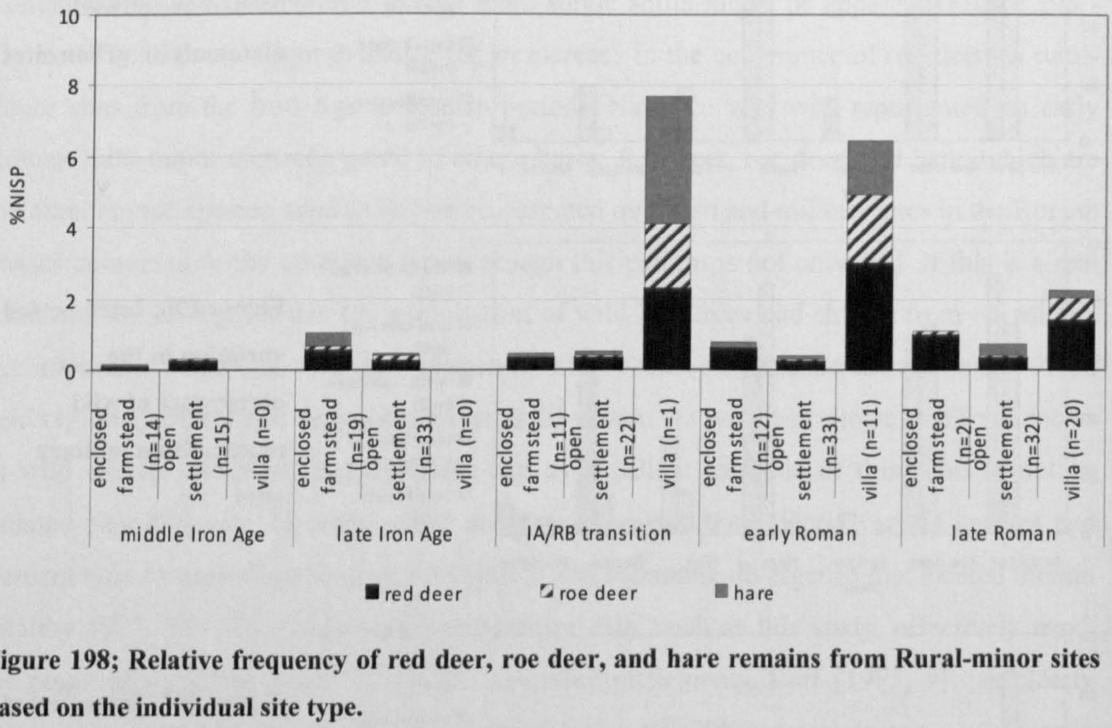


Figure 198; Relative frequency of red deer, roe deer, and hare remains from Rural-minor sites based on the individual site type.

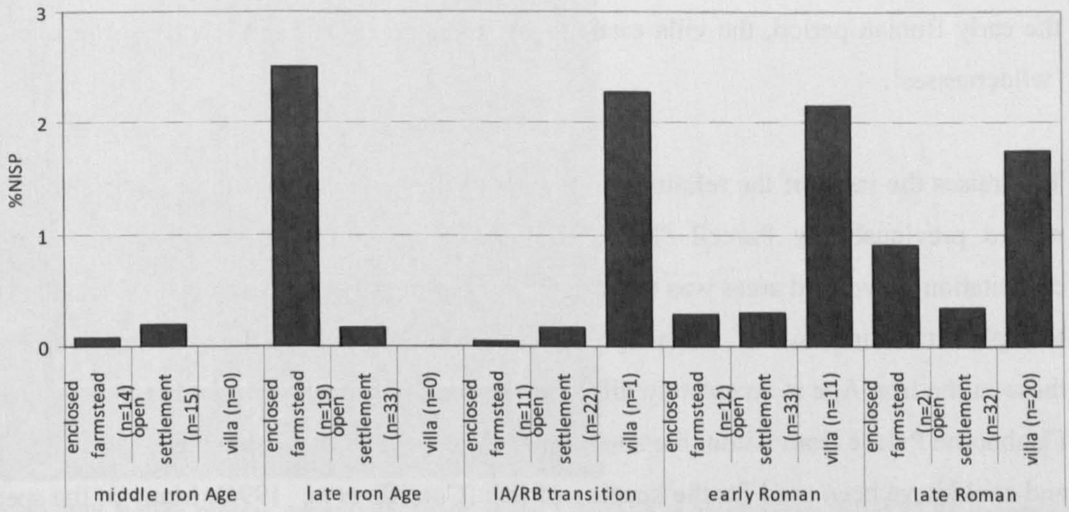


Figure 199; Relative frequency of wetland bird remains from Rural-minor sites based on the individual site type.

Cool (2006, 111-114) highlights the disparity between the limited zooarchaeological evidence for wild animals in late Iron Age and Roman Britain compared with the abundance of historical and artistic imagery which allude to the role of hunting as an important part of contemporary British lifestyle (Strabo *Geograph.* 4.5.2; Bowman and Thomas 1994, 206; Henig 1995, 159). Grant (1981, 210) concluded, from the bone data, that deer hunting was, in general, 'not necessary or appropriate'. However, as we saw from the Fishbourne data this was not the case everywhere. The percentage of wild mammals found on villa sites in the early Roman period is not excessively different to the wild mammal frequencies seen on elite sites in the Norman period (Sykes 2004, 61-68). This is significant given that Normans are hailed as being the real hunters of British history (*cf.* Gilbert 1979; Cummins 1988), and yet the data presented here suggests that the elite of the early Roman period should perhaps be viewed in similar terms, something to which we return in the next chapter.

The historical evidence suggests that a level of continuity with the perceptions of the wild continued from the Iron Age with links to a divine realm. Arrian (*Cyn.* 31.4-36.4) noted how he and his hunting companion followed the Celtic custom of making sure they engaged the help of the gods, and that anyone interested in hunting should never neglect the deities of the wild. The origins of this history are firmly rooted in Ancient Greek customs, an association which links all 'Roman' hunting (Anderson 1985, 115-125; Lane-Fox 1996). Certainly, the Emperor Domitian's relationship with hunting is known from his adoption of Hellenistic imagery (Tuck 2005, 244-245). Whilst wild animals were not being exploited overall to a greater extent it would seem that the people who were carrying out hunting were looking towards the continent rather than shamanism for their source of power. For elite groups in the early Roman period, the villa estates may, to some extent, have replaced the Iron Age 'wildernesses'.

This raises the issue of the relationship between villas and their natural setting. It has been argued previously by Purcell (1995, 158), based upon quotes from Tacitus, that the exploitation of wetland areas was the prime location for only the wealthiest who could afford to exploit it: to 'improve' it. Certainly the representation of fish on Roman sites compared to those in the Iron Age is completely different (Figure 202). Archaeological evidence south of Fishbourne Palace from within the southern garden suggests that fishponds were constructed and could have been used for the keeping of fish (Cunliffe *et al.* 1996). Many of the species identified from Fishbourne are at home in artificial ponds, particularly bass, mullet and wrasse (Wheeler 1969). These three species in particular are noted by Columella (*De Re Rus.* 8.17.7-9) to have been kept in ponds on the villa estate. The significance of these spaces will be discussed further in Chapter 7 though here it is important to highlight the relationship between people and fish within the literary context. Gilhus (2006, 74) notes how land animals were controlled by domestication or the technology of the arena (see Chapter 7); fish however, belonged to a strange world, interacting with people in a limited manner (see also Purcell 1995). Indirect evidence for fishing is evidenced by the recovery of fish-hooks from Fishbourne Palace, Chichester Cattlemarket (Down 1979, 200-201) and at the nearby late Roman fort of Porchester Castle (Cunliffe 1975, 212-213).

Iamblichus (*On the Pythagorean Way of Life* 36) notes how Pythagoras paid the fishermen to release their catch, a tale which exemplifies how some in the ancient world valued the lives of fish but also the power they held over them (*cf.* Gilhus 2006, 20). The ballan wrasse premaxilla recovered from Fishbourne at the southern end of the west wing closer to the southern garden (Figure 200), was the only specimen of this species and was an animal held in high regard by Pliny, a fish to be revered as a living, noble creature (Figure 201). Gilhus (2006, 30) reports that it was relatively common for fish to be elevated in status. Many fish in ponds have been recorded by Roman writers to respond to voice, music, to be fed directly from the hand, and even be cuddled (*ibid.*). The importance of live fish and their maintenance is exemplified by Columella (*De Re Rus.*8.17.7) who talk of them in fond terms, in fact similar to sheep by arranging 'stalls' for our 'water-flock'.

Figure 200; Ballan wrasse premaxilla from phase 1 deposit at Fishbourne, FBW87-88 (photo by author).

Figure 201; Ballan wrasse *Labrus bergylta* off a soft seabed ©Paul Newland

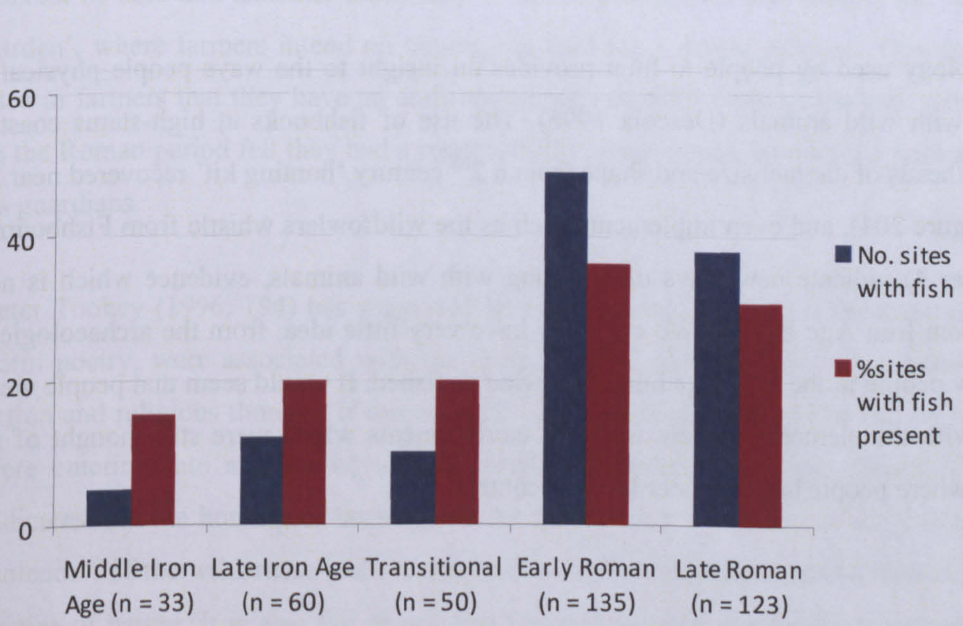


Figure 202; Proportions of sites which include fish remains across the transition.

Figure 203; Two fish-hooks from Fishbourne Palace (c.AD75-100), (photo by author).

It is well noted that the Roman landscape of property was developed with display in mind, so that the visible nature of the practices carried out therein could propose the power of the proprietors (Purcell 1995, 164). The positioning of Fishbourne within a perceived 'natural' environment, I would argue, was designed so that the inhabitants could enter into a realm beyond the ordered, domestic agricultural or urban landscapes, to display what were nominally uncommon activities to a native Iron Age society. It is within this space that political power was negotiated and displayed through performance by the inhabitants at Fishbourne, and other villas, to redefine their social status within the local community. Hunting, fishing and fowling gave the elites an opportunity to demarcate themselves by stepping into liminality (*cf.* Cartmill 1993, 235).

The technology used by people to hunt provides an insight to the ways people physically interacted with wild animals (Descola 1996). The use of fishhooks at high-status coastal sites, arrowheads of distinct size and shape from a 2nd century 'hunting kit' recovered near St Albans (Figure 204), and even implements such as the wildfowlers whistle from Fishbourne (see Chapter 4) indicate new ways of engaging with wild animals, evidence which is not apparent from Iron Age Britain. We currently have very little idea, from the archaeological record, how people in the Iron Age hunted, fowled or fished. It would seem that people were engaging with the elements in new ways, in environments which were still thought of as divine but where people had a greater level of control.

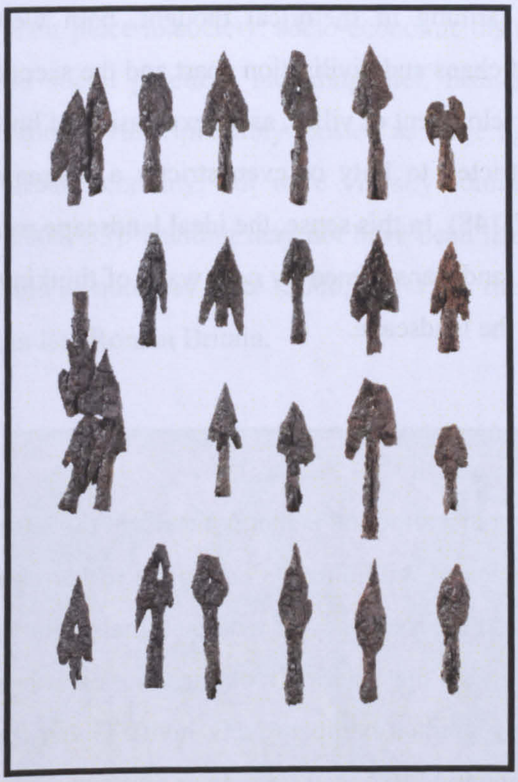


Figure 204; Turner's Hall hunting kit including arrowheads of different form and size for hunting different types of animal (photo courtesy of St. Albans Museum).

Ethnographic research has tended to show that all farmers believe their work to be in harmony with nature (Silvasti 2003). Thompson (1995, 53-55) has argued that this perception has developed from the religious-philosophical doctrines of: 'hard work', where work ethic is derived from the local economic milieu rather than local environmental conditions; the 'doctrine of grace', where success is divinely ordained on the yields of harvest of land and animals, essentially levels of production; and finally, the 'myth of the garden', where farmers intend on taming the land for a divine purpose. This generates the idea in farmers that they have an anthropocentric custodial relationship with nature. People in the Roman period felt they had a responsibility, a right even, to own the wild and become its guardians.

Peter Toohey (1996, 194) has suggested that hunting and fishing, as demonstrated through Latin poetry, were associated with the divine, that is they provide a link between human action and religious thought. If this was the case then it may have been that by hunting you were entering into a space beyond the ordered domestic landscape. Greene (1996, 221) indicates that the hunting of beasts gave the human race a way out of the chaos (the 'mad violence') of the wilderness and created civilisation, an act which can be related back to the origins of nature. It is also fair to say that the poet Grattius was keen to juxtapose hunting with Rome's fight against barbarians (A Poem of Hunting, trans. Wase Gent 1654). Whilst there was a separation between hunting and farming in rhetorical thought, both were important: the first in order to keep the worlds of chaos and civilisation apart and the second to maintain the ideal domestic landscape. The development of villas, as an expression of how to live in the countryside, was clearly not restricted to Italy or even strictly a 'Roman' identity (Woolf 1998; 2001; Terrenato 2007, 147-148). In this sense, the ideal landscape was not about land conquered by military might but land transformed by new ways of thinking, new ways of acting, and new ways of perceiving the landscape.

6.4 The Visual Display of Nature

The contrast between the Roman period and the medieval period is that, whereas in the latter the elite hunted more and more, i.e. the frequencies of wild animals continued to increase over time (Sykes, pers comm.), in the Roman period the frequency of wild mammals reduces into the late Roman period on elite sites. This suggests that hunting took place less and less (although the frequencies of wild birds and fish remained comparatively high). Given the initial increasing evidence for hunting in the early period this may be seen as an unexpected anomaly, as the role of hunting in pastoral societies is intimately linked to landscape and ideas of ownership (*cf.* Wickham 1994). Therefore, we would expect that in a period when landscape rights were being increasingly defined, as seen with the introduction of landownership laws (Mattingley 2006, 354-358), hunting would also increase. Based on the zooarchaeological evidence however, this does not happen. How are we to interpret this pattern? The answer may lie in the realms of ecology. It may be that the sharp increase in hunting at some elite sites, such as Fishbourne, caused depletions in local wildlife populations. Such a phenomenon is suggested to have happened in the medieval period, a fact that may have contributed to the construction of hunting parks (*cf.* Rackham 1997, 39; Sykes 2004, 68). Wildlife depletion is known to have taken place elsewhere in the Roman Empire due to overhunting by the elite and the military, particularly in North Africa (Coates 1998, 25, 38; Hughes 2003, 26).

However, the difference in hunted species is seen between sites of different status within Roman Britain. Overall the frequency of wild animal exploitation does not change over the transition, so other interpretations need to be considered. By the late Roman period the economy of Britain seems to have been quite rigidly structured. As seen in Chapter 3 the differences in cattle ageing between 'producer' and 'consumer' sites had become quite marked, more so than in the early Roman period. There seems to have been a stricter division between the 'rural' and the 'urban' as the road system and the market economy had developed over time (*cf.* Mattingley 2006, 527, 531). It is possible that most people knew their place in society: socio-economic distinctions were clearly delineated by a wide variety of social practices including diet, fashion, architecture, and funery custom (*ibid.*). Late Roman villas probably existed as large agricultural centres, being intimately linked to the urban economy, but were visually-dominating the countryside of southern Britain (Scott 2004, 55). Hunting may not have been needed as a marker of status and identity. That said, and as noted by Cool (2006, 111-114), the illusion of hunting remained a powerful allegory in late Roman Britain.

Figure 205; 4th century mosaics from Romano-British villas. Left: deer hunt mosaic from East Coker, Somerset. Right: Representation of Winter with hunted hare from Chedworth, Gloucestershire.

The zooarchaeological data remains sufficient to suggest that hunting and wildfowling continued on villa sites in greater frequency to other forms of rural settlement in the late Roman period. However, the indication that hunting was not as commonly practised belies its regularity of display in artistic form (Figure 205). What is interesting about the early Roman period is that whilst there is increased evidence for hunting, depictions of hunting are relatively absent. There are no mosaic depictions of hunting at Fishbourne Palace; the only artistic references come from gladiatorial scenes on imported pottery (Dannell 1971). The act of hunting and the artistic display of hunting may have existed in equilibrium in Roman Britain. As a visual exhibition hunting was very important; whether it was acted out or alluded to is a different matter. It may be that after the excesses of the early period and the grand hunting practices of the elite settlements, hunting had become intimately associated with villas regardless of whether people were engaging with wild animals on a physical level or not. Of course, if the local fauna had been denuded from those earlier excesses and had upset local ecosystems to the extent that game animals were no longer as abundant, then artistic impressionism had to take on those implicit meanings instead. It might seem inappropriate to jump from the early to late Roman period and claim that the same meanings surrounded hunting practice. However, as Scott (2004, 39) points out, the display and desires of the late Roman elite in Britain and beyond were visually represented through their villa estates and can clearly be identified with the practices and writings which were important in the late Republic and early Imperial period. Whilst interaction with nature may not have been common in late Roman Britain it was frequently demonstrated in the psychological landscape of the elite.

The decreasing level of hunting practice in late Roman Britain suggests that by being rare (compared to the early period) and, by now, enveloped within an elite culture, individual acts may have had increased social importance. The evidence suggests that where hunting was practised it was associated with cultic ideology. Cool (2006, 116) has argued that the artistic hunting scenes from Roman Britain were representing religious symbolism and were linked to the appropriation of knowledge and understanding (see also Perring 2003, 105). This suggests that hunting continued to be important as it became rarer but was increasingly embedded in elitism and the divine. Interestingly, some religious sites in this period begin to show evidence for relatively high wild mammal frequencies as well as other hunting associations.

The temple-mausoleum at Bancroft, Hertfordshire, produced high percentages of horse, dog, and red deer, recovered along with fox and hare, and together these remains were seemingly linked with the deposition of spears around the shrine (Holmes and Reilly 1994, 517, 531). At this site, a hunting motif also seems to have been associated with the shrine (King 2005, 360). The temple-mausoleum and shrine at Bancroft were an important part of the villa grounds (Williams and Zeepvat 1994), again reinforcing the link between elitism, hunting and the villa estate. King's (2005, 360-362) analysis of animal bones at Roman temple sites enabled him to categorise 'group C temples' as ones associated with hunting, in particular emphasising the association of horses and dogs. Other religious sites with increased horse remains include Folly Lane, Hertfordshire (Locker 1999) and Witham, Essex (1999, 205). Also, several horse and rider figurines were recovered at Brigstock, Northamptonshire (Dix 1986). The representation of the horse in these contexts has been suggested to have had a chthonic element and representative of a hunting cult (King 2005, 361).

Phases	Statistical difference between periods (P) MIA	LIA	IA/RB	ERB	LRB
Middle Iron Age		0.22	0.23	0.0002	0.0042
Late Iron Age	N		0.13	0.001	0.0402
IA/RB transition	N	N		0.0055	0.09
Early Roman	XXX	XXX	XX		0.14
Late Roman	XX	X	X	N	

Table 47; Statistical data for relative frequency of horse remains between phases. Number values (P) in the upper columns are the results of the t-test between the percentages of horse by phase. X and N values in the lower columns give the statistical difference between the phases. X = significant at the 95% confidence interval; XX = significant at the 99% confidence interval; XXX = significant at the 99.9% confidence interval; N = result was not significant.

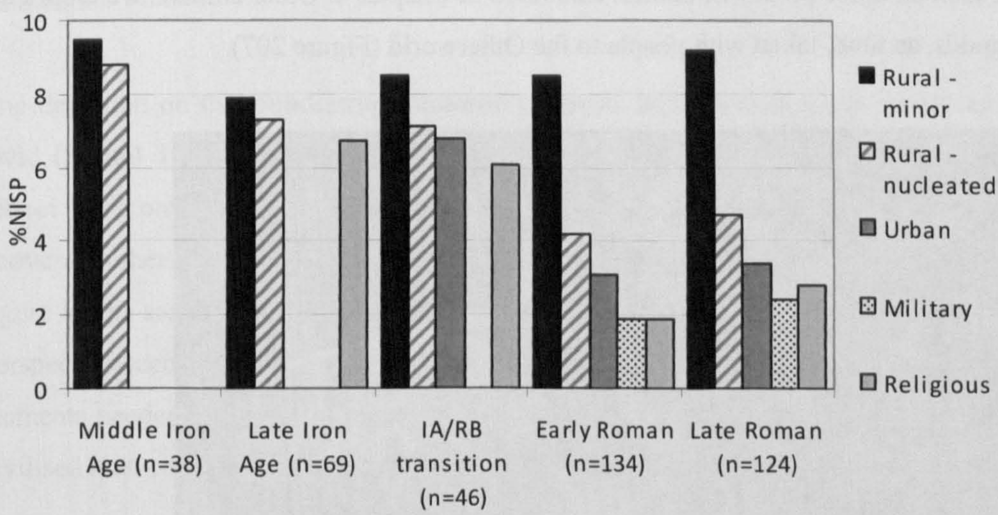


Figure 206; Relative frequency of horse remains against cattle and sheep/goat by site type and phase.

The relative frequencies of horse remains are significantly different on sites in the Iron Age compared to those in the Roman period (Table 47). This difference is not apparent on rural-minor sites across the transition but elsewhere they are less frequently recovered (Figure 206). The lower frequency of horse remains recovered on military and religious sites does not reflect a decreased importance. Clearly military horses would have been very important. The significance of horses in religious contexts may reflect hunting activities, but whether these were actively carried out or not with those animals is uncertain. However, their place in the cosmological landscape was assured. The contrast between Iron Age and Roman ideology in this sense is that humans and horses were separate beings in the latter where previously they were, as argued earlier, cosmologically entwined.

Cartmill (1993, 235) asserts that hunters can find themselves on either side of the human-animal boundary, but it is only by hunting that they understand what that boundary is. In the Iron Age there existed human-animal hybrid gods where humans and animals were enmeshed, as seen on coin imagery or the Cernunnos depictions, but in the latter Roman period we have 'human' gods with animal companions such as the statue of Mars with the goat and the chicken recovered from Uley (Woodward and Leach 1993). Whilst some places remained sacred over the transition, the meanings of the spaces and the acts taking place therein may have changed. In the Iron Age, horses may have been seen as psychopomps, animals which carried people or souls to new realms (see Green 1992, 163-164; Rozwadowski 2001, 79-89). In the Roman period, animals were more often separated in religious contexts. Horses gained their own place such as in the examples given above, or in the late Roman horse pit at Fishbourne examined in Chapter 4. Other animals were buried as grave goods, as food, taken with people to the Otherworld (Figure 207).

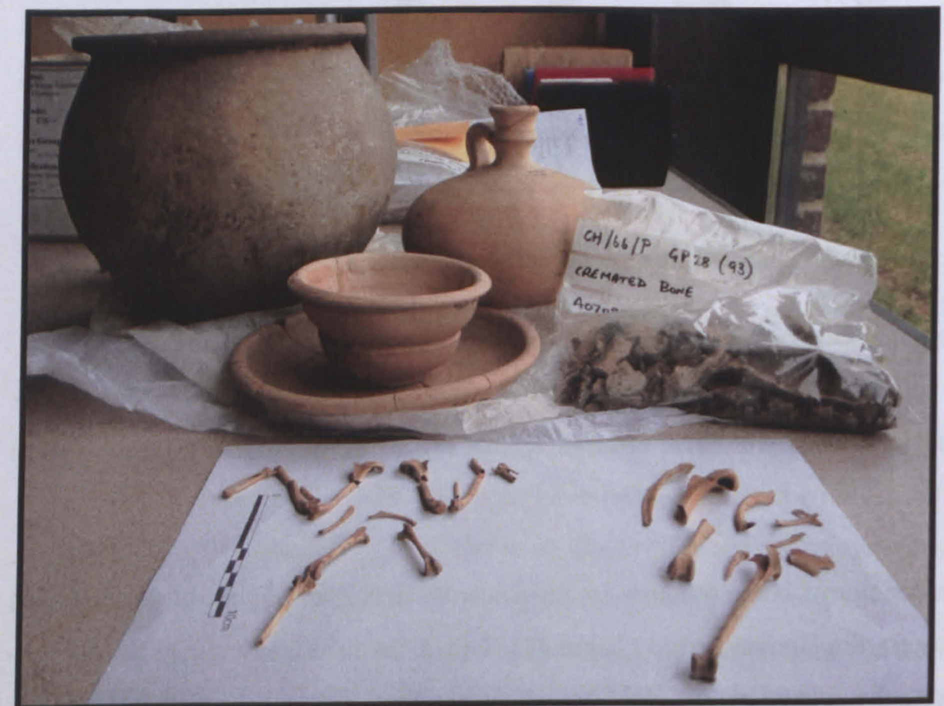


Figure 207; Remains of a woodcock (left) and a mallard (right) interred in a 3rd century AD cremation burial at St Pancras, Chichester, West Sussex (photo by author).

6.5 The 'Nature' of the Iron Age/Romano-British Transition

Most pre-industrial societies live in tandem with the rhythm of the seasons and are dependent on the health and fertility of flocks and herds. Their dependence on these changes places them in close proximity to the 'natural' environment. However, the view that people are separate from nature is a general tenet of the modern western world (Ingold 2000, 40-41). The wilderness is cross-culturally believed to be a place beyond the domestic realm (Morris

2000; Rye 2000). By moving towards and into the wilderness, whether it be on horseback or to trap wildfowl, people are making statements about the society they dwell within. The idea that the wilderness was treated in different ways by Iron Age and Roman society has, more recently, been highlighted (Sykes 2010; Allen and Sykes forthcoming). People feel responsible for the wilderness and the animals which live within it, and their engagements with those animals and the environment can be viewed as a dialogue between the two (Ingold 2000, 67-68). One aspect of the Gundestrup Cauldron is the representation of harmony in the Cernunnos depiction, a deity which was clearly present and widespread in Iron Age Britain (Ross 1967, 180-201), suggesting that 'in the beginning' all life existed together in accord. This I suggest is an extremely central depiction of the ways and manners which people in the Iron Age cosmologically perceived animals and their 'natural' landscape.

The depiction on the Gundestrup Cauldron contrasts with Roman origin stories as told by Ovid (Sproul 1991, 169-170), where man is born from chaos with the unique ability to reflect back onto the sacred world. This inherent gift immediately raises man's position above all other animals from the outset. Man works alongside Nature, as a kind of deity figure in this sense, in ordering the world. The mixture of human and animal in the Iron Age perspective seems to have been viewed as disorder by Roman society where nature and all its elements needed to be put in place because the chaotic world had no shape, a place where civilised man could not live (Sproul 1991, 171).

> Land, to be sure, there was, and air, and ocean,
> But land on which no man could stand, and water
> No man could swim in, air no man could breathe,
> Air without light, substance forever changing,
> Forever at war: within a single body.
>
> (*Metamorphoses*, Harris trans. 1973, 4).

Many of these literary works were being produced in the late Republic and early Empire of the 1st centuries BC and AD, around the time that Britain was moving into the sphere of influence of the Empire (Cunliffe 1988). It is well known that cultural and economic exchanges where taking place between Britain and the Roman world at this point (Creighton 2006). There is sufficient evidence from the 'national' dataset to suggest that a greater range of species of mammal, bird, and fish were being exploited in the Roman period across the Britain compared to sites in the Iron Age (Figure 208). Beagon (2005, 15) has suggested that Pliny understood the natural world to have divine significance and along with humans were together active in providing sustenance - physical, emotional, and spiritual - for the needs of Man. This seems to indicate that people were *allowed* to physically engage with the environment rather than hold it as something sacred, to be viewed but not touched. The idea that people could actively work together with Nature for human benefit implies that to intrude on the natural world and take from it what people wished was perfectly acceptable. The average number of animal species from British sites across the transition seems to corroborate such a view where more animal life, particularly animals from the air and the water were being caught and consumed on settlements to a greater degree than that in the Iron Age (Figure 208).

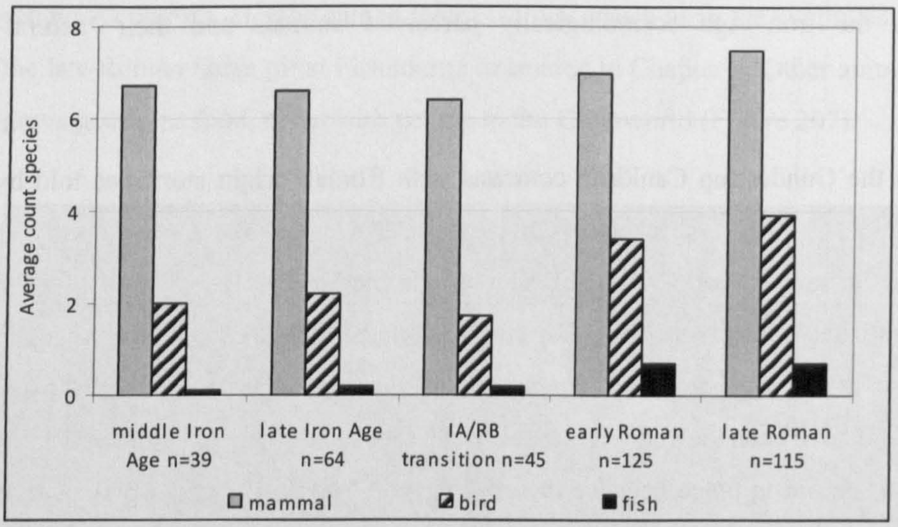


Figure 208; Mean count of species divided between 'mammal', 'bird' and 'fish' groups recovered on sites across Britain from the middle Iron Age to the late Roman period (n=no. of sites).

The difference may have been that in the Iron Age, people and the natural world were indivisible and people were enmeshed within as is indicated by Iron Age artwork (see Chapter 6.1 and 6.2), but the scripts of Roman writers suggest that humans were a dominant part of nature and that the animal kingdom existed to serve man. The position of humans in the world had altered conceptually, much in the same way that the work of Darwin in the 19th century had implicitly shifted Mankind and God from the upper pedestal of Nature (Ritvo 1987, 39). So far however, whilst the zooarchaeological evidence does hint that a shift towards the exploitation of more species of animals took place over the transition, the evidence is slight, probably mitigated at this level by the ranges of people and functioning of settlements which existed. The direct consumers of this literature in Britain would have made up a small group and so no dramatic change was probably felt, but rather a slow transfer of knowledge and development of ideas. Some people, however, would have been exposed to the literary sources and clearly had connections which transcended across the English Channel.

The Roman scholar Lucretius saw Nature as hostile to man, in regards that the human race must fight Nature, to cultivate the earth in order that it is not turned over to the wilderness; Pliny the Elder, by contrast, viewed man and Nature working together for the benefit of the earth (Beagon 1996, 299-300). He rejected the mechanistic world of the 'atomists', such as Lucretius, preferring the concepts of teleology and of the beneficial deities of which Nature herself was one (*NH* 2, 2-4; Beagon 1996, 285). In the *Historia Naturalis*, Pliny's great encyclopaedia of the world, even the wilderness is rationalised and is described in terms of human engagement (Beagon 1996, 300). Intimately tied within these understandings of creation once more is the indispensable presence of animal life. Considering these thoughts it may thus be of no surprise that a distinct increase in hunting is displayed by elite groups in early Roman Britain, as a divine demonstration of power over the wild.

Pliny's view was that although humans exist within Nature, both share an active role in shaping the environment. It is clear from the outset that Pliny's work had a political dimension, one which advocated Rome's position as an orderer of chaos through the organisation and display of knowledge (Murphy 2004, 213). Roman administration was constantly documenting elements of its Empire so that a conceptual domination of land could be held. What Pliny did was extend the power of the Emperors past their human subjects onto the rest of nature (Beagon 2005, 23), and this is particularly important as the *Historia Naturalis* documents ethnic groups who were outside Imperial boundaries. Rather than being places set apart from the natural world, villas (Purcell 1987; 1994) and towns (Purcell 1996) were places set within perceived natural environments so that the physical and aesthetic components of these – rivers, grassland, and woodland – could be turned into 'civilised' versions ready to be exploited and enjoyed by people in safe environments: aqueducts, gardens, and parks. The role of animals in these places, with their combined and complex meanings, will be a subject for Chapter 7 but here it is important to highlight that Roman attitudes to nature were, far from separating themselves from it, aimed towards engaging and benefitting from the valuable resources it had to offer.

6.6 Summary

This chapter has aimed to highlight the role of animals in constructions of nature and religion and how these were displayed through the landscapes of Iron Age and Roman Britain. Remains of wild animals and horses, those which are usually minimal on archaeological sites and, as such, are somewhat neglected in the discourse of many zooarchaeological reports in favour of more 'economic' animals, reveal a great deal of information regarding cultural worldviews. Nature and religion seem to have been intimately entwined, but across the Iron Age/Romano-British transition were exhibited in distinctly different ways. Iron Age communities seem to have negotiated with the world around them, their cosmology reflected by the avoidance of resources from 'outside' (Green 1992, 241; 2004), whereas elite society in the Roman period actively engaged with a greater variety of wildlife. Natural History is often described as 'Man's' struggle to tame the wild and chaotic nature (Ritvo 1987, 111). In the Victorian period similar changes came about with the advent of modern zoology and Darwinism, but the ideology remained bound within the religious mindset of the day (*ibid.*). Pliny's *Historia Naturalis* can be viewed in very similar light. The zooarchaeological record are direct reflections of the way in which people engaged with, behaved in, and thought about their surroundings. This section now moves from the link between nature and religion to a closer focus on the meaning of those spaces created in an Imperial context. The animals which were moved from foreign lands into Britain must have dramatically transformed the landscape in multiple ways. The next Chapter will move the discussion forward to look closer at the Imperial influence on the animal landscapes of Britain.

Chapter 7: Imperial Landscapes

In the last chapter we saw how cosmological landscapes were being constructed through animals as a reflection of attitudes towards nature and religion. It became apparent that some of these psychological landscapes were formed with the influence of the Roman Empire. One of the main shifts in worldview from the Iron Age to the Roman period was the increased concern with places beyond the 'local'. Considering that this thesis has, so far, dealt with issues largely pertaining to Britain in isolation, it is essential to consider the wider significance of the Roman Empire. Imperial landscapes are intimately linked with power (*cf.* Mitchell 1994; Ryan 1994; Driver and Gilbert 1998; Blunt and McEwan 2002). They can signify and symbolise power relations, but also work as a form of cultural practice acting to highlight new forms of ideology whilst naturalising within new surroundings (Mitchell 1994, 1). Imperialism is displayed through a variety of different cultural media – art, science, literature, fashion, – in order to perpetuate superiority over other polities and societies (Wylie 2007, 123). With this point in mind it is my intention to examine the ways animals may have expressed and transmitted ideas of imperialism across the Iron Age/Romano-British transition and to better understand some of the landscapes formed as a consequence during this period.

The development of the Roman Empire is well-known and, academically, has generated a long history of archaeological interest into the impact of the state upon its provincial landscapes. Purcell (1990, 23) argued, through his work on Cisalpine Gaul, that landscape alteration and maintenance was symbolic of elite networking, stating '...the display of the power of the conqueror to grasp the landscape, human and physical, and change it, is what is essential to Roman imperialism...' Forced environmental development is viewed by some authors as politically-motivated symbolic landscaping. For instance, the vast grid-patterning of fields seen in some Roman provinces, known as 'centuriation', has been interpreted as a demonstration of Imperial power as much as it was utilitarian in function (Terrenato 2007, 152-153; Johnson 2007, 5). The lack of centuriation in Britain suggests that the pre-existing 'Iron Age' landscape was already complex, and was developed to a degree where dramatic imperial acts were not deemed appropriate. Mattingly (1997) and Alcock (1997) have emphasised the importance of arbitration between state and population, arguing that Imperial landscapes were not simply imposed, but were a result of negotiation, accommodation and resistance. Other features – towns (Pitts and Perring 2006), forts (Hanson 1997), and roads (Witcher 1998) – may have been just as important in providing spaces where imperialist ideals were formed. Dietler (2005, 66-67) has stressed that archaeological studies of colonial encounters require attention to specific local patterns. It was not simply the spaces which produced imperial ideas but the communicative actions and movements carried out therein; indeed it was these which created and gave meaning to those spaces (Tilley 1994, 22-26; Pitts and Perring 2006).

It is well known that a number of new animals were imported into Britain during the Iron Age and Roman periods (see chapters in O'Connor and Sykes 2010). Animals can be overtly symbolic, and it makes sense to discern the meanings of the many ways animals are 'placed' by human societies into their local material environments (Philo and Wilbert 2000, 5). This concept has previously been studied in depth where animals have been linked with imperialism in past societies (Ritvo 1987, 243-254). In terms of Roman Imperialism in Britain, however, the role of animals is yet to receive attention in this context (though see Sykes *et al.* 2006). Domestic fowl (Poole 2010), fallow deer (Sykes *et al.* 2006), and donkeys and mules (Johnstone 2010), are just a few introductions which might have influenced the ways that people approached and understood the spaces where they resided – each animal embodying its own meanings and categorisations. Of course, many of these introductions may not have been deliberately inserted by the Roman Empire, though this does not discount the possibility that they came to signify imperialism on some level. Millett (1990) strongly argued that much of the imperial overhaul of *Britannia* came through a series of passive transformations which took place across the transition simply as a consequence of becoming part of the Empire. This is not to suggest that animals are passive agents of course – far from it – but they may have come into Britain at some point during the Iron Age or Roman period and become embedded within changing or developing environments, possibly even becoming the embodiment of those spaces. This resonates with Mitchell's (1994, 10) idea that landscape is not a form of reprehensible imperial design, but is better understood as an unfolding of imperialism, moving in its own directions in time and space from a central point of origin.

This chapter will examine animals that were introduced to Britain during the Iron Age and Roman period, the species mentioned above, and assess their impact on the creation, maintenance and perception of different types of landscape. Both historical and anthropological evidence is important here because these illustrate human perceptions towards such animals. Within the examination of each of these species I will touch upon the environments they were placed within, moved through, and gave meaning toward. This leads the chapter onto an examination of specific forms of landscape which newly formed across the Iron Age/Romano-British transition through interactions between people and animals. To begin I will discuss the role of military and urban settlements as reflections of Empire-wide affiliations and examine their role on the wider landscape returning briefly to the issue of arable farming and the exploitation of marginal landscapes. Beyond this, my aim is to focus, in particular, upon gardens, parks and amphitheatres. Together, these forms of localised space cut across and associate with a range of socio-environmental contexts, including 'urban', 'rural', and 'military'. As is common with many political/military conquests, a restructuring of landownership tends to take place (*cf.* Vivenza 1998; Thomas 2008). This chapter concludes with a consideration of how developing concepts of 'imperial' space (if that was how it was perceived) could have tied to new forms of ownership and the pivotal role animals played in this ideology. My analysis focuses on how animals were involved in the ways people related to their local environment and perceived the wider world in relation to imperial ideals and the use of these in the creation of cultural identity.

7.1 New animals

This section focuses specifically on three species, and a subspecies, which are currently recognised as being imported to Britain during the Iron Age and Roman period: domestic fowl, fallow deer, donkeys and mules. It is my intension to examine the impact that these animals made upon the cultural landscape and assess how far these represented imperial ideology associated with the Roman conquest of Britain.

7.1.1 Domestic Fowl

It is now well established that domestic fowl were introduced into Britain prior to the Roman conquest (Maltby 1997, 402; Poole 2010) with the earliest zooarchaeological records currently tracing their import to some time during the early to middle Iron Age (Legge 1988; Hamilton 2000d). The historical evidence also suggests that domestic fowl were present in Britain during the Iron Age through Caesar's much quoted statement: 'hare, fowl and geese they think it unlawful to eat' (Caesar *Gallic War* 5.12; Serjeantson 2000, 499; Albarella 2007, 396; Poole 2010; Allen and Sykes forthcoming). What this reference indicates is that 'Iron Age' and 'Roman' populations perceived domestic fowl in different ways and it has long been suggested that domestic fowl became the most frequently recovered bird species on the majority of sites into the Roman period (Maltby 1981; 1997, 402). Although the initial introduction of the species took place many centuries before the Roman conquest, it is evident that the management and consumption of domestic fowl increased dramatically during the Roman period. The data presented in Figure 209 shows the relative frequency of domestic fowl against quantities of cattle and sheep/goat remains. The frequencies of domestic fowl are minimal throughout the Iron Age, becoming slightly better represented on rural-nucleated sites during the transitional phase, but are relatively well represented on all site types in the early and late Roman periods. The relative frequencies are particularly high on urban and military sites compared to rural and religious sites in the early Roman phase, though on urban sites the proportion of fowl increases to 10% against cattle and sheep/goat into the later phase whereas it reduces on military sites in this period closer to that on rural-minor sites at around 4%.

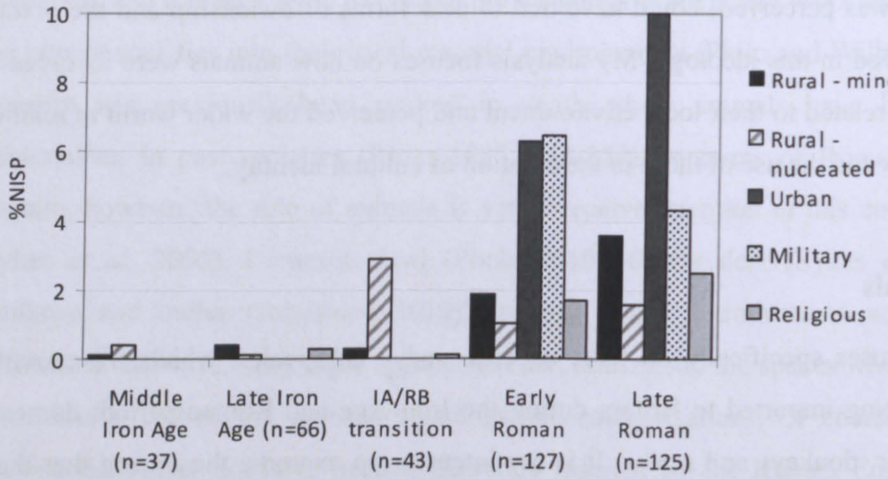


Figure 209; Relative frequency of domestic fowl remains (calculated against cattle and sheep/goat remains) on sites

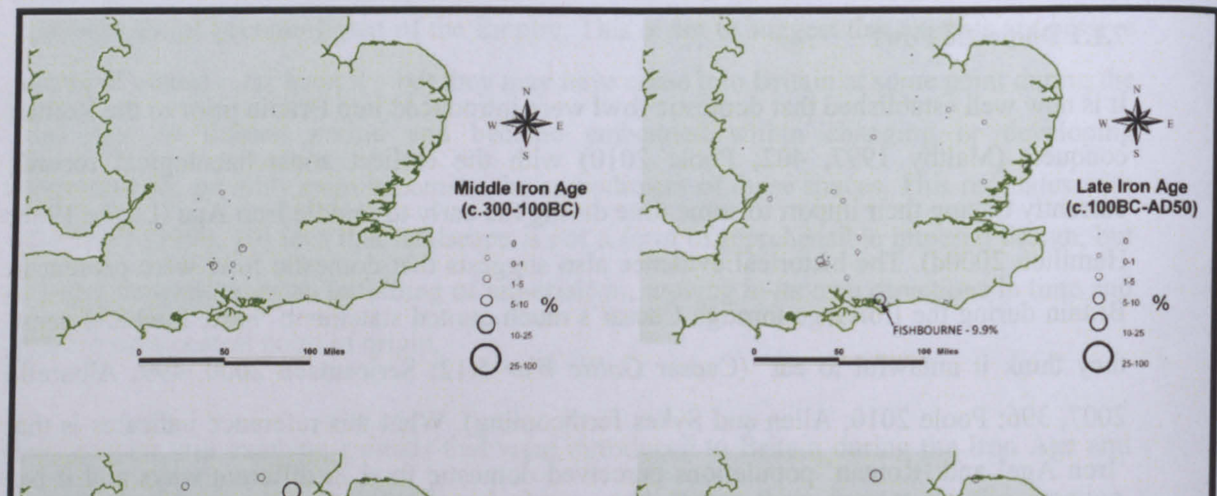


Figure 210; GIS maps showing the variation in percentages of domestic fowl remains compared to cattle and sheep/goats by site from the middle Iron Age to the late Roman period.

These patterns are similar to those found by Maltby (1997, 412-413) where urban and military sites produced domestic fowl in the greatest quantities. My data, however, shows that it was at these types of site where the consumption of domestic fowl had most dramatically increased from patterns seen at Iron Age sites. Detailed illustrations of the geographical spread and growth of chicken husbandry are provided in Figure 210 where, again, it is not until the 1st/2nd centuries AD that domestic fowl became common. Importantly these GIS maps suggest that the growth of chicken husbandry was not obviously different by region. Indeed the maps seem to convey that the shift was a 'nationwide' development. The concentration of domestic fowl remains at urban and military sites raises the question of whether the birds were raised at those sites or supplied. Maltby (1997, 412) suggested that the former may have been true. Domestic fowl are relatively easy to keep and tend to remain within fixed localities of their own accord (Collias and Collias 1996). Being kept within towns and forts may have afforded increased protection for domestic fowl from the dangers of predators compared to rural sites.

As shown in Chapter 3 the proportions of domestic fowl at Fishbourne were very high compared to other local sites where the recovery of domestic fowl remains was minimal, except from Roman deposits at the urban centre in Chichester. Biometric data from domestic fowl bones indicated the presence of both male and female populations at Fishbourne, as well as the existence of medullary bone from female specimens which provided evidence of egg-laying. These suggest that domestic fowl were reared at Fishbourne from an early phase. This marks a change from widespread 'Iron Age' patterns where only some sites kept domestic fowl, with many of the remains coming from associated bone groups, such as the pit burials at Houghton Down (Hamilton 2000d), Grately South (Hammon 2008), Winklebury Camp (Jones 1978), Dragonby (Harman 1996) and Silchester (Grant 2000). It may have been that chickens, throughout the Iron Age, were considered an exotic animal, due to their rarity, and they may have been important for reasons other than for food. Serjeantson (2000, 499) has raised the possibility of cock-fighting on the basis of high proportions of male birds recovered from late Roman Silchester (see also Poole 2010). The use of animals in sporting display was clearly an important past-time of the Roman army (Carnutt 2001, 277).

The place of the domestic fowl in towns and forts may have been a common sight, one which came to separate those places from those elsewhere simply through the greater presence of the animal. As Philo (1995, 51) points out, the ways that human communities think, feel and talk about the animals they live close to shapes their social responses towards them on an everyday basis. One could argue that these changing patterns of domestic fowl exploitation were a reflection of ideas which derived from the continent, but had transferred much later than the introduction of the bird. It is quite clear from the agronomists that fowl husbandry had developed into an important part of life on a rural farm in Italy, at least by the 2nd century BC when Cato was writing (*cf.* White 1970, 322-327). Together these writers include detailed descriptions regarding the appropriate size of flock, equipment, and areas set aside for the construction of chicken coups, through to the physical management of the birds: feeding, breeding and hatching (*ibid.*). It may be that such organised levels of fowl husbandry did not develop in Britain until the late Roman period, when their remains become more frequent on rural–minor sites in general, and was only present in the early Roman phase at high-status sites such as Fishbourne. These actions represent different types of behaviour by people towards these animals.

It would be far too crude an interpretation to associate these differences in behaviour with 'Romanised' people in towns, villas and forts against 'natives' on farms and in villages. However, it may have been more apparent that the types of environment where people resided contributed towards differing perceptions of those animals. Whilst domestic fowl appear to have been rare in the Iron Age, perhaps perceived as exotica, they seem to have flourished in pre-Roman oppida and later towns and forts. Domestic fowl, as a social group of animals, had become intimately bound up with the lives of city-dwellers and soldiers. Pliny (*Hist. Nat.* 10.24) notes how 'our Roman night-watchmen, a breed designed by nature for the purpose of awakening mortals for their labours…go to bed with the sun, and at the fourth camp-watch recall us to our business'. The military overtones are clear through Pliny's memories of being in the army (Pliny the Elder served in Germania under Vespasian (Beagon 1992, 3-5)) and the important role of the cockerel had in waking the soldiers. In socio-spatial terms, domestic fowl seem to have become an accepted part of 'urban' and 'military' spaces (*cf.* Philo 1995, 66). Whilst people where clearly eating domestic fowl in greater quantities in the Roman period compared to that previously, their place amongst human society had ultimately changed and they seem to have been most at home in places built after the Roman conquest in Britain, in settlements more closely associated with 'imperial living'.

7.1.2 Fallow Deer

Fallow deer are native to Anatolia (modern Turkey) but their zooarchaeological remains are being recovered with increasing frequency on Roman sites across the Mediterranean and northern Europe (Sykes *et al.* 2010; pers. com.). Their presence in Roman Britain is a subject which has recently been covered in substantial detail by the research of Sykes (2004; 2007b; 2007c, 76-78; 2009; 2010; *et al.* 2006a; *et al.* 2010). Prior to this work, the debate long raged over whether fallow deer were imported to Britain by the Romans or the Normans (*cf.* Whitehead 1972; Chapman and Chapman 1975). It is now apparent that the introduction of this species was far more complex involving a number of separate importation events (Sykes 2010). It is thought unlikely that the fallow deer of Roman-date have contributed to today's *Dama* population (*ibid.*). Nonetheless, the isotopic analysis of fallow deer dentition from Fishbourne revealed that live animals had been imported to Fishbourne in the 1st century AD and had continued as a managed herd at the site for some time, indeed it has been postulated that a park was designed at the site in order to house these animals within (Sykes *et al.* 2006a, 954-956).

This research has given credence to other contemporary finds of fallow deer which were previously thought to have been intrusive from a later date (see for example Hamilton-Dyer 2004). This is not to say that all 'Roman' finds of fallow deer are securely dated. For instance, a fallow deer specimen from Redlands Farm originally recorded as 'Roman' (Davis 1997), was later found to be a medieval intrusion (Bronk Ramsey *et al.* 2000). Other specimens recorded from this period also require further analysis to substantiate their dating and, in some cases, precise identification; a problem which has been previously highlighted (Sykes 2004). As I have found from my own analyses at Fishbourne the identification of fallow deer remains is not a straightforward venture (see Table 48). However, the substantial collection of securely identified and dated specimens of fallow deer from Fishbourne (see Chapter 3) alongside other collections, such as the 2nd – 5th century assemblage from Monkton, Kent (Bendrey 2003) and Canterbury, Kent (R. Bendrey pers. com.; *cf.* Sykes 2010) suggest that live fallow deer existed in various places in Roman Britain. Indeed the geographic nature of Thanet as an Island, where the site at Monkton is situated, makes it a highly suitable place to empark fallow deer (Sykes pers. com.). It is also true that both eastern Kent and the Fishbourne region were areas intimately associated with the Roman invasion (*cf.* Manley 2002), perhaps an important psychological link between these animals and notions of Empire and conquest.

Site	Type	Date	NISP	Antler	Post-cranial	Reference
Lydney, Gloucestershire	rural	Iron Age	1	X		Wheeler 1932
War Ditches, Cambridgeshire	rural	Iron Age	2	X		White 1964
Fishbourne, West Sussex	elite	Roman	38 (12)	X	X	personally collected
Cowdery's Down, Hampshire	rural	Roman	1		X	Maltby 1983
Dorchester-on-Thames, Oxfordshire	rural	Roman	1	X		Grant 1978
Monkton, Isle of Thanet, Kent	rural	Roman	9	X	X	Bendrey 2003
Scole-Dickleburgh, Norfolk	rural	Roman	1	X		Baker 1998
Catsgore, Somerset	small town	Roman	1		X	Everton 1982
Canterbury, St Georges, Kent	urban	Roman	1		X	*cf.* Sykes *et al.* 2010
Canterbury, Whitefriars, Kent	urban	Roman	2		X	*cf.* Sykes *et al.* 2010
Chichester, Cattlemarket	urban	Roman	1	X		personally collected
Chichester, Lavant Culvert	urban	Roman	1		X	Hamilton-Dyer 2003
London, Salvation Army site	urban	Roman	1		X	West 1983
St Albans, Park Street, Hertfordshire	urban	Roman	1	X		O'Neil 1945
Wroxeter, Shropshire	urban	Roman	2		X	Meddens 2000
Haymes, Gloucestershire	rural	late Roman	2			Noddle 1986
Grandford, Cambridgeshire	small town	late Roman	1			Stallibrass 1982
Henley Wood, Somerset	temple	late Roman	5	X		Jones 1996
Dorchester, South Grove Cottage, Dorset	urban	late Roman	1		X	Startin 1981
Barnsley Park, Gloucestershire	villa	late Roman	6			Noddle 1985

Table 48; List of sites with evidence of fallow deer *Dama dama* remains from Britain of Iron Age or Roman date (NISP quantity in parenthesis represents specimens which were identified as 'fallow/red' – the main figure is inclusive of this sum).

Iron Age finds of fallow deer are restricted to two sites – Lydney, Gloucester, and War Ditches, Cambridgeshire – which have produced antler fragments (Wheeler 1932; White 1964). These by contrast to the Fishbourne, Monkton and Canterbury fallow deer remains do not necessarily indicate the presence of live animals but may instead indicate the importation of antler. It is possible that some of the finds of fallow deer of Roman date are also part of an Empire-wide trade in exotic body parts (*cf.* Sykes 2004). This makes such finds important and associated with Roman imperialism in their own right. Sykes (2010) asserts that the importations of fallow deer body parts were probably transported north from southern Europe. Whilst this may be true in many instances the existence of live *dama* in Roman Britain now means that shed antler may have come from individuals already residing in Britain and traded within. The find of an almost complete fallow deer antler from a Roman deposit at Chichester Cattlemarket is more likely to derive from the herd present at Fishbourne considering the proximity of the two sites (Figure 211). This does not mean that traded fallow antler were no longer meaningfully associated with long distances but, rather, could be seen as an extension of the wider imperial network. Once more this relates back to Mitchell's (1994, 10) assertion that imperial landscapes develop by unfolding from various points of origin and indeed fold back on themselves, multi-layering the landscape with meaning.

Figure 211; Fallow deer antler recovered from 3rd century pit at Chichester Cattlemarket previously misidentified as red deer (Photo by author).

The recovery of a Roman-date fallow deer antler from Scole-Dickleborough, Norfolk (Baker 1998 – radiocarbon dated to the 4thC.AD: *cf.* Sykes *et al.* 2010) included a number of shave marks which have been tentatively suggested by Sykes (2010) to indicate the production of medicinal powder, a notion based upon Pliny's (*Hist. Nat.* 27) assertion that fallow deer antler could be utilised in such ways to cure a range of different ailments. Indeed the antler from Chichester Cattlemarket noted above also showed signs of shaving as well as tines which had been sawn from the main beam (Figure 211). The specimen had continued to be modified after leaving the body of the animal. Helms (1988, 126-130) argues that exotic goods traded across the Roman Empire tended to take on magical or spiritual significance in contexts outside their point of origin. Fallow deer or body parts from fallow deer could be seen in this context in Roman Britain, as a 'sacred treasure from the wilderness' (Helms *ibid.* 127). Sykes (2004; 2010) notes that the deposition of fallow antler and feet (represented by metapodia and phalanges) in votive deposits became common across Roman Europe. Five fallow deer specimens from the temple site at Henley Wood, Somerset, are so far the only ones which belong to an overtly religious Roman site in Britain (Jones 1996). It may be significant that many of the animal remains at this site, which also included specimens from red deer, hare, domestic fowl, and species of wildfowl and fish, were excavated from individual votive deposits rather than from mass culls of animal sacrifice such as at Hayling Island and Uley (*cf.* King 2005, 345).

We must remember that these antler 'artefacts' would have been no ordinary articles of commerce. Animals from distant lands, whether real or imaginary, will have a particular meaning for native inhabitants beyond that of the fauna present in the local landscape

(Pluskowski 2005, 292). The rarity and confinement of fallow deer to a few places in the province could still render their perception as an exotic animal and representative of 'far-off lands'. The life history of a fallow deer and its body parts are not simply part of an economic trade system but become a palimpsest gaining new significance through each stage of movement and modification. Pluskowski (2005, 292) lists the stages of the life history of exotic animals, dead or alive, as follows:

1) The original geographical and cultural context of the 'real' animal.
2) The circumstances surrounding the identification and acquisition of the animal.
3) The extent of initial anthropogenic modification and its relationship to morphological characteristics.
4) The stages of transportation from source to market outlet.
5) The extent of secondary anthropogenic modification and its relationship to morphological characteristics.
6) Further transportation and modification (if applicable).
7) The cultural context of the final form and its place of deposition.
8) Its contemporary identification.
9) The daily 'consumption' of the body part:
    a) Levels of accessibility (awareness, physical, visual) to different social groups and how/whether this changed over time.
    b) Active (e.g. ceremony) or passive (e.g. display) use of the artefact and how/whether this changed over time.
    c) How both of the above can be related to perception and identification of species in this context.

Inhabitants at Fishbourne may have engaged with fallow deer at a number of these stages, seeing them being imported and emparked, being bred, reared and hunted. But also, as dead animals, their antlers were collected as shed 'body parts'. The bodies of the deer were butchered and parts placed in different contexts: one metatarsal from a 3rd century deposit in the west wing of the Palace showed a number of cut marks around the proximal shaft, indicating that the animal had been skinned. No doubt the fur would have been highly prized. Pluskowski (2005, 294) highlights the interest and great distances with which pelts from exotic animals were moved in the medieval period, indeed many were important for social display and 'a range of ceremonial activities in both secular and religious contexts, complemented by skulls, skins, shell and fossilized bones'. The extensive trade in exotic goods in the Roman period suggests that similar phenomena occurred (Helms 1988, 125-130; Hughes 2003).

For the majority of people coming into contact with fallow deer it is quite likely that they only interacted with the animal at one or two of these life history stages. But if we turn this gaze from the anthropocentric to the *dama*-centric for a moment, these stages reflect the world as experienced by the animal. These are the spaces in which it inhabited: its landscape. The animal came to embody each context and defined the place where its encounters and negotiations with people took place (*cf.* Whatmore 2002, 31-34). This perspective enhances Pluskowski's (2005) view that exotic animals came to be identified and perceived in different ecological and cultural contexts. It also has important implications for the construction of different landscape spaces, such as parks and gardens which will be examined in greater detail further on, but here it is important to show that fallow deer, as an exotic animal in Roman (and Iron Age) Britain was placed within a variety of different social contexts and treated in complex ways, but ones which related to an imperial network across Roman Europe. Whilst fallow deer would have to have been exchanged or gifted into Fishbourne in the first instance (Sykes *et al.* 2006, 953-956), there is historical evidence which suggests that fallow deer had flourished in Britain so well that some animals had eventually been exchanged or gifted back to the continent. The Emperor Gordian I (*c.*AD159-238) owned a collection of around 200 stags which included British deer with antlers shaped like the palm of the hand, *cervi palmate ducenti mixtis Britannis* (Toynbee 1973, 144). From the country of origin to the final resting place, *Dama* existed as live animals, body parts, raw materials, medicines and religious artefacts. As Helms (1988, 129) notes: 'it is useful to remember that...traditional societies were well aware of the existence of unknown and therefore mysterious realms beyond the geographic borders of their worlds.' Fallow deer transcended the landscapes of those who encountered them in Roman Britain, both geographically and psychologically.

7.1.3 Donkeys and Mules

As noted in Chapter 3, donkeys are a species of equid separate from horses, whereas mules are a hybrid of a female horse and a male donkey. In terms of environmental adaptability, donkeys are at their limit in Britain and are likely to only flourish with human intervention and care (Johnstone 2010). Hybrid breeding does not usually happen in the wild due the lack of overlap between the natural habitat ranges of horses and donkeys (Clutton-Brock 1999). Therefore, the presence of mules usually suggests human control over breeding (Johnstone *op. cit.*). The presence of mules in Roman Europe is well documented in historical sources which suggest they were economically important and relatively common around the Mediterranean (Clutton-Brock 1999, 121). They are known to have been used for pulling carts, baggage and the plough; they were ridden, both by the public and the military, which suggested to Johnstone (2008) that their breeding had been controlled to some extent by the state rather than solely by farmers. The rationale for breeding mules is economic: they are larger, stronger and survive on fewer rations when travelling over longer distances than either parent species (*cf.* Johnstone 2010).

However, this apparent abundance of donkeys and mules in Europe is difficult to detect from the zooarchaeological record, where certified remains of Iron Age and Roman donkeys and mules are scarce. The difficulty in separating equid remains has been shown by Johnstone (2004) to be caused by inadequate identification methodologies. Johnstone (2010) has noted that only two records of donkey have been securely identified from Roman contexts (*cf.* Bendrey 1999; Baxter 2002) with only one instance of mule (Armitage and Chapman 1979). My own data collection has shown two published cases of donkey: one from the 4thC.AD villa at Frocester, Gloucestershire (Noddle 2000) and the other at the early Roman small town at Wilcote (Hamshaw-Thomas 1993). Unfortunately there are no methodological details regarding how these identifications were made. As detailed in Chapter 3, my metric analysis of equid remains identified candidates for a donkey and a mule from Copse Farm and Chichester Cattlemarket respectively. These specimens require further exposure to discriminant function analysis (DFA – *cf.* Johnstone 2004, 149-150) to ascertain whether these identifications are positive.

Johnstone's (2004, 217-288) detailed analyses of horse remains have identified a small number of probable examples of both donkey and mule in Iron Age deposits from Britain. The sites noted – Thorpe Thewles (Durham), Danebury (Hampshire), Hengistbury Head (Dorset) and Skeleton Green, Hertfordshire – have considerable evidence of long distance contacts and trade links with the Roman Empire (Johnstone 2010). Johnstone's (2004; 2010) identification of Romano-British mules can be separated into an 'early Roman' group where deposits are most commonly associated with urban and military sites, and a 'late Roman' group which are primarily found on high-status rural sites, mainly the villas of the 3rd and 4th centuries. Johnstone (*cf.* 2008; 2010) has interpreted this as evidence that mules were imported as live animals to Britain with the military, and subsequently the knowledge for breeding them was taken on later by wealthy landowners on late Roman villas. The economic impetus for this was to use a 'more continental model' as a means of supplying the road-based trade network rather than the traditional use of rivers.

Whilst the quantity of data remains small, these are important insights. Firstly, the implication that a change from water-based transport to one focused on roads was fundamental to ways people traversed and experienced their landscape. Mattingley (2006, 366) suggests that travelling through Britain during the Iron Age would have been a largely different experience to the Roman period. We might expect a largely open countryside in the Iron Age with 'regional boundaries' forming mainly upon natural features (Bradley 2000, 158-161). The Roman landscape, by contrast, contained features which would have embodied messages of Imperial domination (see also Hanson 1997). The road system was largely engineered to connect state interests: towns, forts, and natural resources such as iron mines (Mattingley 2006, 136). The importing of mules as part of the military 'baggage train' went hand-in-hand with the development of the road system and the movement of the army around the British mainland along new routes in conquered territory. The presence of donkeys and mules, we might now argue, was intimately bound up with these features, themselves being associated with imperial notions of travel.

Johnstone (2010) has argued that the production of mules on late Roman wealthy estates in Lincolnshire, Cambridgeshire and Northamptonshire was used to supply the military forts of northern England and the coastal installations of the southwest. Whilst the evidence for donkeys or mules at Fishbourne and its hinterland sites is currently unproven, the evidence of metalled roads, carts, horseshoes, and the identification of wheel-tracks as highlighted in Chapter 4, together illustrate the use of 'equid-power' and the geography of travel between different settlements. Movement along pathways serves to enhance experience of the places they connect by helping to establish a linear order to the landscape (Tilley 1994, 30). Roman roads represent new pathways of moving through the British landscape and, as Tilley (*ibid.*) points out, only high-ranking or wealthy individuals are powerful enough to invent a path or establish a landscape relationship which did not exist before. Helms (1993, 224) notes how travelling along routes laid through 'wild' or 'uncultured' land is seen as safe passage for people and animals which are socially ingrained in the cultural ideology being expressed by those pathways and the places they connect. The use of new roads by people and animals has also been argued to be an attempt at denying the past (Witcher 1998). As such, there must also have been people who avoided those 'new' routes. There is a clear cultural importance attached to pathways (*cf.* Tilley 1994, 206-207), and repeated movements along old routes would invoke memories of the 'old landscape', including a refusal to accept, or a resistance of a new environment: in this context, an Imperial landscape.

The introduction of animal bells in the Roman period, as argued in Chapter 4, could enhance our understanding of human and animal movement. As noted previously, the new sound of hearing animals move through the landscape incites a different experience for people. The bells found at Fishbourne are most likely to have been worn by sheep. However, the find of a bell attached to and deposited with an equid (argued to be a mule) in a 1st century AD military context in *Germania* shows the link between these artefacts, equids, and the army (Schlüter 1999). Sound enhances people's experience of movement and can thus be seen as a new form of embodied practice performed within the cultural landscape (*cf.* Wylie 2007, 121-126). The presence of the Roman army in 1st century AD *Germania* illustrates the presence of a foreign body travelling within a 'non-Roman' place.

As imported animals to Britain, either as individuals or through new knowledge of breeding practices, donkeys and mules were 'new animals' i.e. they looked different to horses (Johnstone 2010). Columella (*De Re Rus.* 6.36) clearly focuses on the aesthetic values of the parents of the mule prior to breeding, but also notes how temperament and behaviour are important too. Genetic variation in 'farm' animals has been shown to develop significantly diverse temperaments in individual animals (Rushen *et al.* 2001, 361). If donkeys and mules behaved differently to horses (which seem to have been introduced far earlier (see Chapter 6; Bendrey 2010)) or had altered temperaments, this could have influenced the ways people perceived and engaged with them. 'Traditional' farmers may have treated donkeys and mules, and actions associated with them, with contempt or suspicion (*cf.* Stallibrass 2000, 67). Evans and Yarwood (1995) have shown that the link between livestock breeding and management is intimately tied to the aesthetic appearance of landscape and can come to represent the people living in those spaces by reflecting their behaviour towards their animals. The introduction of new breeds into regions far removed from their native origins, if even for purely economic reasons, can significantly alter landscape consistency (Evans and Yarwood 1995, 142). Perceived differences between animal breeds may have been considerably marked for much of the population during the Iron Age and Roman periods as most of the population lived rural lifestyles which were closely knit with animals (Evans and Yarwood 1995, 145). By moving down public highways, more people could have been exposed to the sight and sound of donkeys and mules than fallow deer for example, transmitting imperial messages to a wider range of people.

Changes in breed must have had implications beyond the economy. Political conquest usually comes with the introduction of 'new' animals, whether they are new species or breeds (see Sykes 2007, 50-56 for a similar situation after the Norman Conquest). Such introductions reflect important cultural and societal divisions within the landscape. Certain species and breeds may then have come to embody particular cultural landscapes. If this change is associated with the Roman Conquest then that embodiment could reflect imperialist ideals, such as domination and continental ethnicity. The rarity of donkeys and mules is interpreted by Johnstone (2010) as the result of logistical difficulties in importing large numbers for breeding as well as environmental factors associated with donkey and mule adaptation. Their presence even in modern times in Britain is rare because of an inability to adapt to the colder environment (Clutton-Brock 1999, 49). However, this rarity may have further singled them out as 'different' animals. Although donkeys and mules of the Roman world are generally seen today in economic terms, it is unlikely that people who engaged with them would have treated them with such ambivalence. The sight of new types of 'horse' travelling along state-constructed pathways may have impacted on people's perceptions of a changing landscape in more ways than we previously imagined.

7.1.4 The 'Placement' of Imported Animals and their Meaning

So far I have focused solely on four species of animal and their relationships with people and the cultural landscape. It is true however, that the full range of imported fauna into Britain at this time was not restricted to domestic fowl, fallow deer, donkeys and mules. Currently, it is believed that a number of animals made their way across the Channel including peafowl (Poole 2010), pheasants (*ibid.*), rabbits (Sykes and Curl 2010), and black rats (Reilly 2010), amongst others. I chose the first four specifically as I aimed to show that these may have been related to notions of imperialism being associated with the Roman Empire, albeit in very different ways. Each came with their own associated meanings, and they were kept and moved through different places. By travelling from distant lands and in their rarity, fallow deer are likely to have been perceived as exotica with elite groups placing them in parks, whereas donkeys and mules, which may have been similarly rare, travelled widely across the landscape along the vast linear highways. Each animal gave a different perspective on the construction and imagination of those particular spaces. Domestic fowl were different to both fallow deer and the equids as they were, by contrast, relatively common in the Roman period, but it is their dramatic shift in frequency from uncommon and rarely eaten animals in the Iron Age (possibly perceived in similar terms to fallow deer in that respect) to become common agents of town- and fort-living.

The ways that people engaged with some of these animals also changed. Mules had to be bred and the evidence from domestic fowl remains at Fishbourne also suggests that these birds were being intensively reared. The deliberate engagement in the life-cycles of these animals is something which does not seem to have taken place in the Iron Age, certainly not to the same degree. The historical literature is abundant with methods for breeding and rearing animals of all types (see White 1970, 272-331 for an excellent overview). Not only are animals moving long distances but understandings of the way they *should* be treated also seems to have travelled from imperial sources. Columella (*De Re Rus.* 6.36-38) details various specific techniques involved in mating different types of equid. Such knowledge seems to have been locally embedded in husbandry practices in Roman Italy. Their development and use in Roman Britain, rather than being a deliberate imposition of knowledge, was a result of the movement of people and animals from one place to another, to be unravelled in a different cultural context (*cf.* Ingold 2000, 229). This then, probably affected the ways people related to the landscape, if indeed it is social practices which create a sense of place (Tilley 1994, 14-26; Ingold 2000, 191-192). Imperial landscapes are incited in the ways that people do things; it is a performance, fundamental in producing identity and notions of power (Mitchell 1994, 1; Wylie 2007, 121). The acquisition of new things – animals and knowledge – is tied to an understanding of social distance (Helms 1993, 32). Roads, as places, were fundamental in organising the landscape according to the geographical perceptions of the Roman state, not the local populace (Purcell 1990, 21). But this clearly took place in the landscapes of the local populace and, as such, would have had a fundamental affect on their perceptions of distance and space.

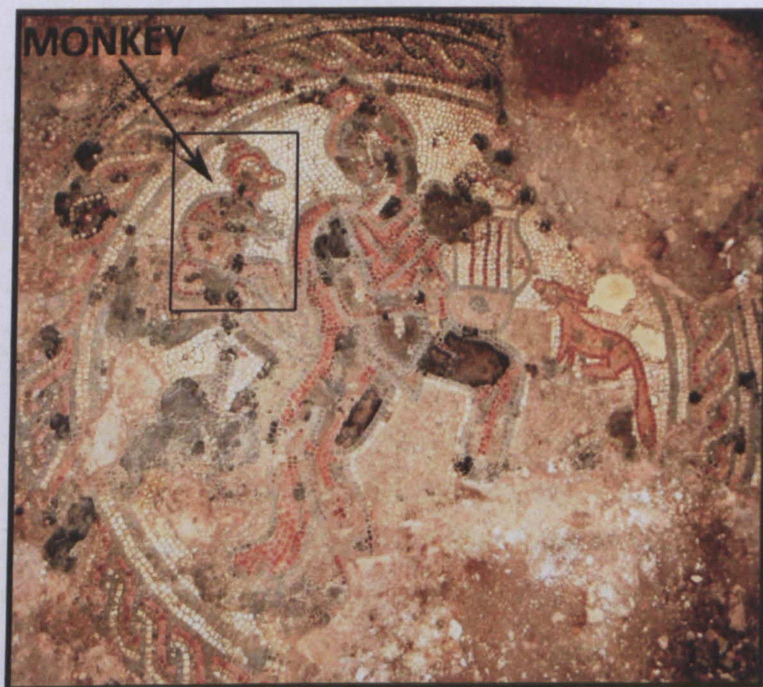


Figure 212; The Orpheus mosaic from Brading Roman Villa, IOW, *c.*2nd-3rd C. AD, showing the monkey at Orpheus' shoulder (photo by author).

The role of exotica should not be underestimated here. Animals from distant lands are depicted in mosaics, such as the monkey in the Orpheus mosaic from Brading Villa on the Isle of Wight (Figure 212) with relative frequency. The Orpheus mosaic in Britain is thought to have demonstrated links between 'power' and 'nature' (Scott 1995). How far can we associate such imaginings of wildlife with the minimal occurrences of traded exotica from zooarchaeological assemblages, such as the skull of a barbary macaque *Macaca silvanus* recovered from a Roman deposit at the small town at Catterick, Yorkshire (Stallibrass 2002)? Barbary macaques are native to North Africa, modern day Morocco in particular. The skull suggests, as with fallow deer, that some people in Roman Britain were concerned with provincial landscapes beyond that of Britain. Even the Latin name *Silvanus* is associated with the wild and outside realms: *Silvanus* was the Roman god of the woodland (Green 1992, 64-65).

Elements of human control over nature enter the evidence here as there seems to have been a desire to view animals captured in space, whether it be as 'real' imports or abstractly in villa decoration. Similar aspirations have been noted of Londoners of the Victorian period who wished to experience animals which represented the far-off places of the British Empire (Ritvo 1987, 207-208). This clearly gave rise to the popularity of zoos during this period – places which captured those animal for all to see (Ritvo *ibid.*). Similarities also exist in the Royal menageries of the medieval period (O'Regan 2002). King Henry IV clearly had a fascination with ferocious animals as his menagerie included lions, leopards, tigers and bears (O'Regan 2002). Such desires to hold power over dangerous animals is commonly associated with King and Emperors (Ritvo 1987, 206). Finds of lion-associated artefacts at Fishbourne, including bosses and knife handle terminals (Figure 213), demonstrates a similar fascination with ferocious wild animals. Comparable artefacts of both types, contemporary in date, have also been recovered from Richborough (Bushe-Fox 1949), again emphasising the connection of these locales with the wider Empire and the trade in exotica, whether real or imaginary.

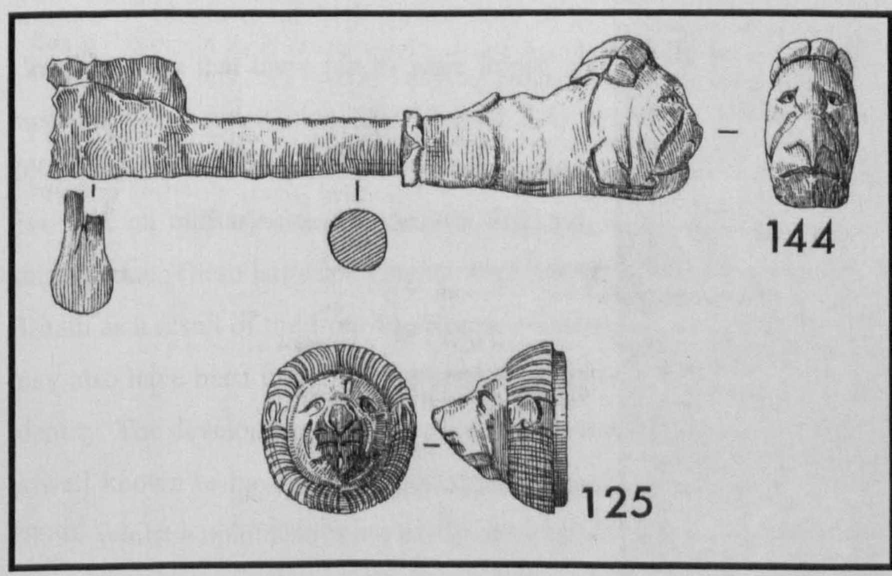


Figure 213; Lion-associated artefacts from 1st-2ndC. AD deposits at Fishbourne. Above: Iron knife handle with bronze lion-head terminal (AD100-150). Below: Bronze lion-head boss (AD43-75). (After Cunliffe 1971, 117-188, 121).

Whilst zooarchaeological evidence for large cats is missing from Fishbourne, another wild animal with imperial associations is present. The left proximal radius from a white-tailed eagle *Haliaeetus albicilla* was recovered from an early 2ndC.AD deposit at the Palace (Figure 214). This bird is native to Britain and it is unlikely to have been an imported animal. However, the eagle is clearly held in noble veneration in the Roman period: Pliny places it in a select group of animals, along with elephants, dolphins, lions and bees, as having outstanding attributes associated with those of humans. By separating imported animals from non-imported ones we are in danger of categorising beyond the cultural placement of animals present in the Roman period. Eagles clearly had imperial associations. It is true that whilst people revered such animals, they also recognised their association with the untamed wild, with that place being the source of their power (Gilhus 2006, 107).

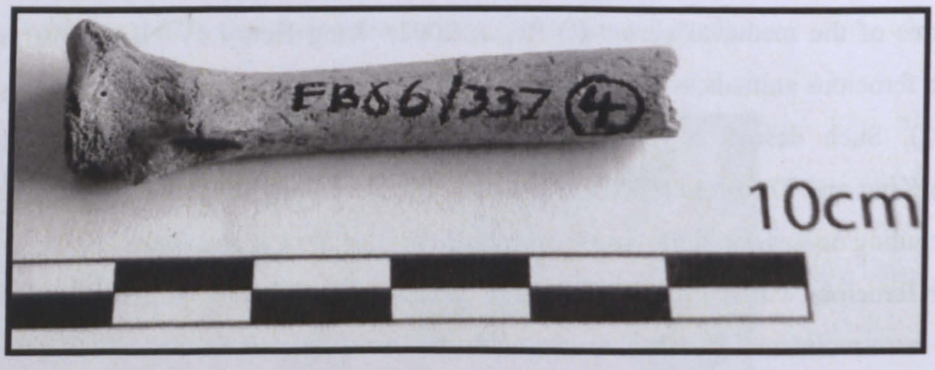


Figure 214; Left proximal radius of a white-tailed eagle *Haliaeetus albicilla* from Fishbourne Roman Palace c.AD100-140.

Figure 215; White-tailed eagle from Warwick Castle, Warks. (Photo by author: October 2009).

The research of Whatmore and Thorne (1998) has suggested that animals perceived to come from faraway places are representative of realms outside of human civilisation, unreachable places which have the power to disrupt the harmony of the cultured world. They argue that wildlife is reconfigured by people into manageable places where the threat of the outside cannot be of harm (1998, 438). In this sense, animals which inhabit the margins of society are routinely moved from *wild* places, not so that the animals can necessarily be tamed, but in order to rationalise those 'outer spaces' within society. This has taken place on large scales, where complex human societies exist, involving multiple *reorderings* of animals and thus, of nature – what Whatmore and Thorne (1998, 437) term the 'topologies of wildlife'. It is becoming apparent that no one animal came to signify a particular place in the Roman Empire. Focusing on a single species is too simplistic if we to understand the spaces different animals inhabited. Roman frescos and mosaics rarely illustrate one type of animal in any given space. These involved various 'foldings' of wildlife; as suggested by Whatmore and Thorne (1998). The next section focuses on some of the landscape spaces which developed in Britain across the Iron Age/Romano-British transition and the ways which animals lived, travelled and died within them and how this impacted on the human populations.

7.2 New Spaces

Legionary fortresses, auxiliary forts and *coloniae* were places deliberately imposed on the British landscape by the Roman state (Hanson 1997). They became arenas where a complex mixture of identities of both native and, in particular, foreign populations lived. I have already shown that these places were important factors in the changing patterns of animal husbandry and distribution (see Chapter 3.1) and, indeed, the work of Stallibrass (2000; 2002) has been instrumental in recent years for increasing our knowledge of the role of livestock on military sites in northern England; an area notorious for poor preservation of animal bone. These large settlements were not the only places which may have developed in Britain as a result of the Iron Age/Romano-British transition. More localised forms of space may also have been important for people to interact with animals to form and display their identity. The development and use of gardens, parks and amphitheatres, in the Roman world is well known to have been important in everyday life (Purcell 1987; Welch 1994; Sykes 2009). Whilst amphitheatres are easily detectable through archaeological excavation, gardens and, in particular, parks are far more difficult and are more commonly examined from a historical perspective. Classical texts provide considerable detail about Roman animal parks but archaeological investigations have been further restricted in Britain where studies have been curtailed by both a lack of documentary evidence and the scarcity of preserved features (Cunliffe 1981; Zeepvat 1991). Despite this, Sykes (2007b; 2009) argues that the detection and physical tracing of park features is unnecessary because their very existence can be determined and understood through zooarchaeological study. The presence of fallow deer at Fishbourne and Monkton can, for instance, be viewed as a proxy indicator for parks, as it seems unlikely that exotic animals would have been transported great distances only to be released to roam freely (Sykes 2009, 28-29). In one sense this method enhances the analysis of these spaces because, rather than focusing upon physical boundaries, we are in fact looking at human-animal relations as activities which were taking place within, and consequently furnishing them meaning. Whilst I advocate this approach here I also seek to integrate faunal remains with historical sources to further illuminate the examination of gardens, parks and amphitheatres in Britain as a reflection of imperial ideology.

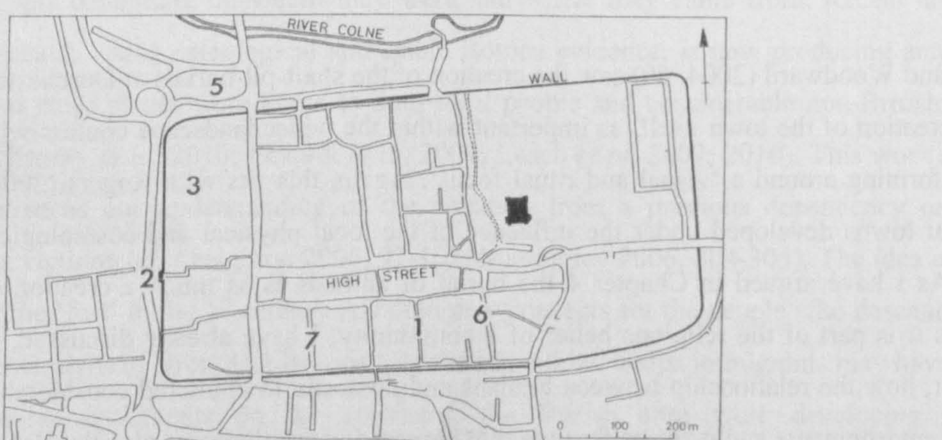
7.2.1 Urban and Military Settlement

Living in fortresses and towns in Roman Britain would have held particular values for people depending on whom they were and where they came from. Recent archaeological research, using osteological and stable isotope evidence, is now producing ample evidence that these places were home to both local people and considerable non-British populations (Chenery *et al.* 2010; Eckardt *et al.* 2009; Leach *et al.* 2009; 2010). This work significantly enhances our understanding of the situation from a previous dependency on epigraphic inscriptions (*cf.* Creighton 2006, 97-103; Mattingley 2006, 304-305). The idea of the 'town' or the 'fort' in the 1st century AD held new concepts for the people who descended from the generations of 'Iron Age Britons'. At the same time, whilst immigrants may have come from similar settlements on the continent, the British sites were developing within new environments; places with existing landscapes and social histories (Creighton 2006, 70-92) Indeed, Rogers (2008) argues that towns developed as a result of the complex relationships between people, their worldviews and the local geography.

Evidence from the earliest phases of the Roman town at Dorchester, *Durnovaria*, suggests that animals were also intimately involved in this process. Woodward and Woodward (2004) examined the considerable quantity of animal burials (many complete) within mid-1st century shaft-pits, interpreting the features as foundation deposits for the town. Sheep and pig bodies were a characteristic of these deposits whilst cattle remains were, perhaps surprisingly, absent (*ibid.* 69-71). However, the majority of animals buried in these contexts were dogs, including juvenile, immature and adult specimens. These features also included regionally-made coarsewares as well as imported Samian wares; together possibly representing a mixing of the 'local' with the outside world. Similar burials of a number of dogs were also excavated from Chichester, *Noviomagus*, and examination of their remains suggested that pathologies were rare and that they had been generally well cared for prior to deposition (Levitan 1989). Morris' (2008, 125) work has shown that dogs become the most common animal in associated bone groups in the Roman period (a shift from sheep in the Iron Age), and Harcourt's (1974) analysis of ancient dog remains from across Britain indicated that a shift in the body size range of dogs occurred over the Iron Age/Romano-British transition from a relatively tight range of medium-large canids in the Iron Age to a much greater variety of sizes in the Roman period, including the appearance of very small canids. This development has been viewed as a somewhat purposeful move towards the breeding of 'household pets' (*cf.* Davis 1987, 192). Fulford (2001, 216) saw the deliberate burial of dogs in the Roman period as a continuity of practice from the Iron Age. However, the relationship between dogs and humans seems to have changed, particularly if they were being bred to produce distinct physical and, perhaps, behavioural characteristics, buried more commonly in manners which were more associated with humans and, importantly, in new urban environments.

Woodward and Woodward (2004, 69) saw the creation of the shaft-pit burials at Dorchester, indeed the creation of the town itself, as important within the wider landscape context with settlements forming around a 'visual and ritual focus'. Again, this fits with Rogers (2008) assertion that towns developed under the influence of the local physical and cosmological landscape. As I have argued in Chapter 4 the burial of animals is as much a creation of landscape as it is part of the religious belief of a community. I have already discussed, in chapter 7.1.1, how the relationship between humans and domestic fowl altered considerably within town environments and it seems feasible that human-dog relationships also developed in meaning, especially if new types of dogs were being bred for new styles of living. The distinction between 'town' and 'country' is quite unlikely to have been conceptually marked in the earliest period of town life in Roman Britain, certainly not in the way that urban centres are thought of in the modern world as the exclusive domain of humanity. Here, there are clear ideas about what animals are appropriate and inappropriate for life in these environments (*cf.* Philo 1995). The development of new spaces would need time to reform people's place in the world and with the other animals which inhabited it.

The relative frequencies of cattle, sheep/goat and pig from my dataset, shown in Chapter 3.1, has indicated that cattle and pigs tend to be much better represented on military and urban sites in the Roman period compared to those elsewhere or previously. King (1984; 1999a; 1999b) interpreted this pattern as reflecting differences in cultural identity from the perspective of meat diets, with beef and pork being more commonly consumed by people of a more 'Romanised' character. However, in isolation the faunal evidence must be seen as a generalisation of the reality. Cool (2006, 82) has remarked on the problem that merely looking at the proportions of species is unlikely to reflect diet in a truly adequate way, and we can surely extend this point to other issues regarding human-animal interaction. As we have seen from the spatial analysis of the faunal remains at Fishbourne (Chapter 4), the roles and uses of animals were multifarious across ancient settlements. Employment of contextual and spatial information in analyses of faunal remains at urban sites have been far more informative for our understanding of the economic pathways of livestock in Roman towns and the ways their exploitation can highlight the multi-layering of social identities existing in those settlements. Our current knowledge of this phenomenon for Roman Britain is clearly indebted to the research of Maltby (*cf.* 1979; 1993; 1994; 1998). His work has shown that, whilst urban dwellers and soldiers could have differentiated themselves on some level from farming communities, the idea of a unified 'urban' or 'military' diet (or indeed any other identity-inducing trait) is highly problematic.



Excavated area	**AD44-61**	**AD61-150**	**AD61-275**	**Total (Roman)**
1: civilian/commercial				0.7
2: *Canabae*	0.1	0.4		0.3
3: Legionary barracks/*Coloniae* area	**6.9**		**4.8**	**5.9**
4: agricultural area				1.8
5: suburban settlement				2.8
6: civilian area				1.3
7: Legionary barracks/*Coloniae* area	**0.9**	**4.1**		**3.1**

Figure 216; Excavated areas of Roman Colchester with frequencies of deer remains by area and phase (map and data after Luff 1993, 9).

Intra-site variation in faunal remains is not solely a phenomenon represented by domestic livestock. At early Roman Colchester the relative frequency of deer (roe deer in particular) remains between different excavated areas suggested that a divergence existed between areas associated with the military and those elsewhere (Luff 1993, 9). These were, either, areas which were barracks when the site existed as a Legionary fortress, or when they had been replaced with accommodation for veteran settlement (Figure 216).

Even at this crude level of analysis the data highlight the differential use of individual species by people to demonstrate variation in dietary practice. It could be argued that the consumption of wild game, a practice which held very particular values for Iron Age society (see Chapter 6.2), was now being performed in areas of a town with associations to the military; people who had a direct affiliation with the Roman Empire. The mechanisms behind these social changes seem to be quite complex as it is clear that people living in other areas were not conforming to this particular dining practice. The specific ethnic identities being displayed in the 'military' areas at Colchester are difficult to clearly elucidate, though King (1984; 1999) has often maintained that such patterns reflect a common link to Gaulish or Germanic influences. It may also be problematic to place people into such rigid ethnic entities based on the spatial character of the archaeological evidence because we lose the ability to view people moving through one cultural group to another (Jones 1997, 36-39). As Maltby (1993, 337) argues, towns acted as arenas where a variety of people from different social, economic and ethnic backgrounds could converge to demonstrate and exchange cultural ideals. Here, animals are the media through which particular practices are articulated.

The rigid structure of military hierarchies would suggest that differences between soldiers of differing rank are detectable through a similar spatial variation in social practices at forts and legionary fortresses. This should, potentially, be more distinct than at urban sites if different groups of people living on military sites were less flexible in terms of their status and social mobility by comparison. This hypothesis seems well supported by the bone data from Caerleon in Gwent. Excavations on one of the houses of the *scamnum tribunorum* (the tribunes of the inhabiting legion) were dwellings of some of the highest-ranking military personnel in Britain (Zienkiewicz *et al.* 1993). The remains from this area can be directly compared to those recovered from other excavations on the fortresses' large communal bath-house. The *scamnum tribunorum* faunal remains as well as those from the *frigidarium* drain of the bath-house were both argued to represent final 'table waste' from consumption episodes (Hamilton-Dyer 1993a 135; O'Connor 1986, 227). The assemblages from the *natatio* (infilling of part of the pool, slightly later in date than the *tribunorum* and *frigidarium*) are less conspicuous but seem to represent a greater range of activities (O'Connor 1986, 230). The differences in the faunal remains between the *tribunorum*, the *frigidarium* and *natatio* are plain (Figure 217). Sieving of contexts was carried out at the *tribunorum* and the *frigidarium*, and this accounts for the higher frequencies of bird remains in these areas but probably accentuates rather than causes the patterns. Wild mammal and bird remains make up a relatively considerable proportion of the remains from the tribune's house, and species included red deer, roe deer, wild boar, hare, woodcock, teal, wigeon and common crane (Hamilton-Dyer 1993a, 133). From each area the domestic mammal remains were almost completely dominated by cattle, sheep/goat and pig bones, and a clear difference between relatively higher cattle and pig remains at the tribune's house compares to an increased frequency of sheep/goat remains prevalent in the *frigidarium* (Figure 218).

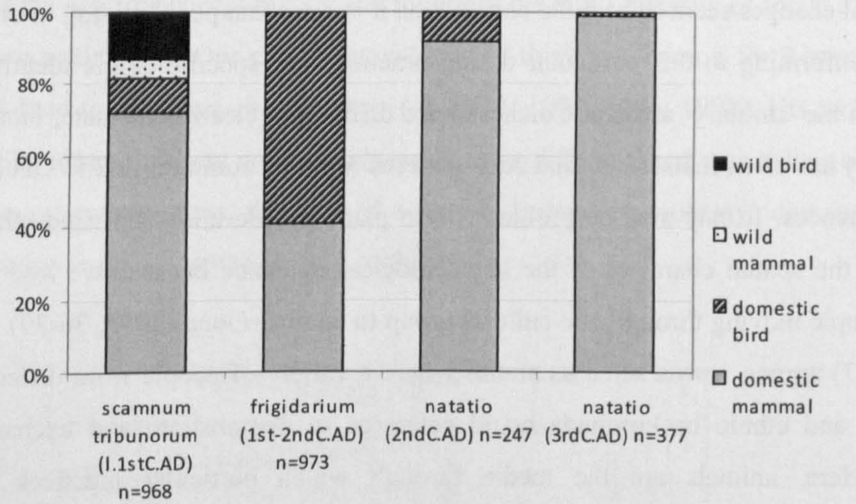


Figure 217; Relative frequency of faunal groups from different areas in the legionary fortress at Caerleon, Gwent (data sources: *scamnum tribunorum* from Hamilton 1993a; *frigidarium* and *natatio* from O'Connor 1986).

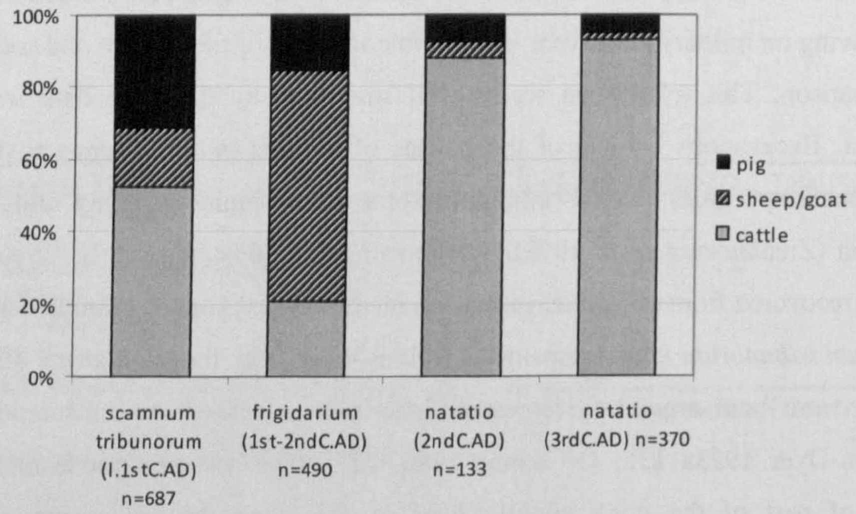


Figure 218; Relative frequency of cattle, sheep/goat and pig remains from different areas at Caerleon, Gwent (data sources: *scamnum tribunorum* from Hamilton 1993a; *frigidarium* and *natatio* from O'Connor 1986).

What is apparent is that species were being chosen specifically and in particular frequencies for consumption in different places. Whilst wild animals, beef and pork were relatively common fare at the tribune's house, consumption of mutton and chicken was more prevalent in the *frigidarium* area, probably representing the eating habits of a greater range of soldiers. Cool (2006, 199) has clearly demonstrated that eating habits were varied across different communities in Roman Britain. The faunal evidence from Caerleon suggests that it also varied within communities as well.

What is more difficult to ascertain are the ways the military obtained their food. This would show how soldiers related to the animals they exploited and to the wider landscape. It is most commonly stipulated that the Roman military requisitioned all of its dietary and material needs from the local hinterland (Davies 1971, 123; King 1999b, 144; Thomas 2008). Hamilton-Dyer (1993a, 136) argues, based on the species proportions and butchery patterns from Caerleon, that the fortress was provisioned similar to Roman towns as the zooarchaeological evidence tends to indicate opposing trends to those generally found on rural sites in Southern Britain. Documentary evidence from the northern frontier zone also indicates that forts on Hadrian's Wall were frequently requesting goods. There are various records in the Vindolanda tablets of food ordering, including what seems to be specific requests by officers for what we may assume to be non-basic items.

> "Ircucisso, as part of the price of bacon, *denarii* 13 $^1/_2$
> Felicio the centurion, bacon, 45 pounds
> Likewise, bacon-lard, 15 $^1/_2$ pounds" [Tablet 182]
>
> (Bowman and Thomas 1994, 132)

What becomes clear from many of the animal-related items being requisitioned in the Vindolanda tablets is that these were being supplied to the fort as products rather than as live, or even as whole animals to be redistributed. These are not limited to food products either, such as orders for goat-skins – interpreted by Bowman and Thomas (1994, 286-287) as materials for tents. This suggests that not only were animals bred and reared at rural sites but their butchery and product manufacture was taking place from local supply centres, and may well have been urban sites or small towns. Another passage suggests the presence of *locario*: places where animals and their herders could lodge and be accommodated (*ibid.* 144). This, consequently, indicates that livestock were travelling distances from the farmstead to places of redistribution and, possibly further, to final consumption. The site most commonly attested, from the tablets, to have been associated with Vindolanda was

Catterick, *Cataractonium*, North Yorkshire, and there is the suggestion that the latter was a producer and supplier of hides and leather (Bowman and Thomas 1994, 34). Geographically, this would make sense considering the position of Catterick and its road-links to Vindolanda, and indeed other forts along Hadrian's Wall (*cf.* Mattingley 2006, 148, 258). However, despite a preponderance of cattle remains from mature animals, Stallibrass' (2002, 403) zooarchaeological analyses of the Catterick material have not, as yet, produced conclusive evidence for a tannery. This does not mean one did not exist in the hinterland of Catterick just that one has not currently been identified archaeologically. Faunal remains from 1st century AD Sheepen in Essex indicates evidence for local manufacturing and supply capabilities, particularly in providing the local military and growing urban presence at Colchester with products (Luff 1985). Biometric data from cattle at Sheepen, compared to other sites across Britain, indicates the selection of animals of a very restricted size range (Stallibrass 2002, 410). The evidence of intensive cattle skinning from the Westward House site at Fishbourne in the 2nd and 3rd centuries AD is also important in this context if it was supplying nearby Chichester. Together with Sheepen, the Fishbourne evidence would argue that the urban landscape sprawled beyond the town, well into its hinterland, with important industrial activities being executed in rural environments.

Figure 219; Partial cattle skeleton from the *frigidarium* drain at Caerleon, late 3rd century AD (Zienkiewicz 1986, plate XXI).

Faunal evidence from Caerleon in the later Roman period indicates that the supply of animals changed in character over time. The infill of the *natatio*, dating to the late 3rd century and after, included high quantities of cattle scapulae, many with evidence of initial stages of bone working (O'Connor 1986, 230). Rather than final products being brought into Caerleon this evidence indicates that manufacturing was carried out on site. O'Connor (1986, 235) also reports that a high frequency of head and feet specimens were recovered from contexts in and around the baths at this point, a pattern which suggests that 'primary butchery, and therefore quite possibly slaughtering, was now going on in the vicinity'. The burial of a partial cattle carcass in the *frigidarium* drain, c.AD290, indicates that cattle may have more often entered the fortress on the hoof by this time (Figure 219). This period broadly coincides with the military withdrawal of Caerleon and the shift to an inhabiting civilian community. On the faunal evidence, not only does the nature of occupancy change at the site but also in the ways that animals entered and existed in the settlement. The presence of livestock inside the fortress, rather than simply animal products, adds to the experience of the place with the sights, sounds and textures of living animals.

One particular way of experiencing animals in the landscape is through their actual killing and butchery as has been demonstrated in Chapter 4. Maltby (2007) has been keen to show the differences in butchery methods between urban and rural sites, with 'town' butchery including the intensive use of the cleaver and standardised methods of carcass dismemberment compared to rural practices more inclined towards small-scale meat-filleting with knives. If towns and their urban populations were important instruments of the Imperial government then, by association, new ways of treating and redistributing livestock and other animals could have been linked into, and perceived as, 'imperial' ways of doing things; and of the redistribution of land. There are clearly spatial variations in the deposition of body parts and in the nature of chop/cut marks placed on those body parts in different areas of towns (Maltby 1993, 1998). At Chichester, the two key assemblages from the Cattlemarket area (Levitan 1989) and Rowes Garage (Knight 2007) suggest that cattle were moving into the former area for slaughter and primary butchery, due to higher frequencies of heads and hoofs being recovered, to the latter areas where other parts of the carcass were found more frequently and with a higher occurrence of specifically-placed knife marks. The incidence of secondary butchery in urban sites, as separate from primary butchery, may well have been a feature which did not exist in rural areas or even prior to the Roman period (*cf.* Knight 2002, 28-33). Secondary butchery seems to have been quite specialised in its manner and execution at Roman towns (Maltby 1994, 100; 2007), but what is rarely discussed in the zooarchaeological literature is the social and aesthetic context in which this 'new' practice was carried out.

At Wroxeter, the trimming and chopping of scapulae, pelves, and rib body parts was being carried out at the *macellum* towards the centre of the town (Meddens 2000, 322-324), an open and public place, as opposed to the primary killing and preparing of carcasses which seems to have taken place (or, at least, the remains are deposited) at the peripheries of towns, outside the 'urban boundaries' (*cf.* Maltby 1979; 1984). Secondary butchery was on display. The extensive cutting, dividing and distributing of meat could have been experienced, through a variety of sensory phenomena, by people living in towns. Symons (2002, 443) has suggested that butchers, in the Ancient Greek and Roman worlds were, in effect, 'secular priests', their social status deriving from the sacrificial rites of dismembering animals in religious displays. As the division of meat moved from the 'alter' to the 'marketplace' butchers were 'presiding at commercial alters, [as] popular distributors of meat, laughter and gossip' (*ibid.*).

One interesting find of an iron cleaver comes from the tribune's house at Caerleon (Zienkiewicz *et al.* 1993, 114-115; Figure 220). This artefact, dating *c.*1st-2nd century AD, was well preserved and showed signs of usage from marks along its bevelled edges. The placement of the piece in a well within the inner courtyard of the house places it close to an oven area (*ibid.* 40-53). The presence of kitchen equipment alongside an oven may indicate that the courtyard formed a kitchen garden at some point during the early Roman phase, similar to the one identified at Fishbourne, albeit on a smaller scale (Chapter 4). However, as with Fishbourne, the display of butchery, cooking and dining, together in one space provides a powerful sensory setting whereby animals could change in form at the (skilled) hands of people. Furthermore, the social status of people could have been defined by the stage at which they came into contact with the animal. For example, the *lanius* (from *laniere*, meaning to cut up meat), probably kept, slaughtered and sold the cattle they owned, whereas the *macellarius* was a market-seller (Frayn 1995, 107-114). It is quite possible that people of similar status were becoming known in Britain, particularly if the spatial and cut mark data from the zooarchaeological evidence can be married here. Not only were animals being redistributed in new ways but the places where these were being carried were probably very significant on a cultural level, representing divisions in both social status and urban space. Differing styles of butchery may indicate that a conceptual difference existed in the manners, attitudes and perceptions of people between 'town' and 'country'. The highly organised pattern of livestock supply, butchery and redistribution was a significant shift from patterns seen in the Iron Age (*cf.* Maltby 2007). If these human-animal relationships related to, and were embedded within the environment, it would suggest that the cultural landscape was becoming ordered and structured in a more organised way, both physically and conceptually.

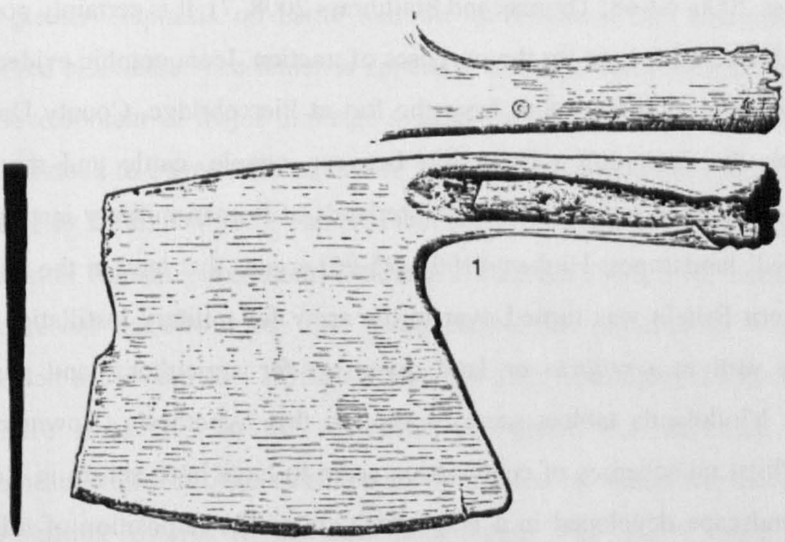


Figure 220; Iron cleaver from the *scamnum tribunorum* at Caerleon, *c*.1st-2nd century AD (Zienkiewicz *et al.* 1993, 115, fig. 41.1).

Far from being a standardised and gradual change, the increasing emphasis on cattle and the ways they were treated through the Roman period seems to have been quite nuanced. Whilst bovids were clearly becoming (relatively) more frequent in Britain, the manners in which they were exploited varied in different places and at particular points in time. King (1978) highlighted the inclusion of livestock into the *capitatio* or land tax, as the Roman Empire experienced economic decline in the later period, as a possible factor in the changes seen in the zooarchaeological evidence. Although Britain was a relatively prosperous province for much of the latter centuries of Imperial rule such taxes seem to have been in place in Britain. The levying of grain for the army would have required an intensified level of land turned over to arable production. Mattingley (2006, 519) suggests that a decreased military presence in Britain in the later Roman period allowed for greater wealth to accumulate in the rural landscape. Much of the grain being produced in Britain was being exported to the continent in order to supply the increasing military presence along the banks of the Rhine (*ibid.*), indeed the *annona militaris* (corn levy) is thought to have been a strictly late Roman phenomenon (Frere 1987, 188).

Differing settlement patterns and landholding arrangements between regions (*cf.* Taylor 2007) may, in some cases, have been influenced by the character of cattle-rearing and arable production, particularly where military presences existed. The north and west of Britain were, arguably, exploited more heavily in relation to available surplus (Mattingley 2006, 495). Despite a relative lack of faunal evidence from northern Britain some sites (though not all) show evidence for larger, possibly 'improved' breeds of cattle (O'Connor 1988; Dobney 1991, 39-40; Stallibrass 2000, 67-68; Thomas and Stallibrass 2008, 7). It is certainly possible that larger cattle could have been bred for the purposes of traction. Iconographic evidence in the form of the Piercebridge Plough group, from the fort at Piercebridge, County Durham (Figure 221), suggests the important relationship between people, cattle and the land. Together, the evidence begins to suggest that the hinterlands of Roman military instillations were becoming 'cleared' landscapes: Higham (1991, 95-96) argues that land in the military frontier zone of northern Britain was turned over to the army for military instillations and surveillance posts, as well as *territoria* or land given up for agricultural and pastoral purposes. Indeed, the Vindolanda tablets seem to support this hypothesis (Bowman and Thomas 1994, 34). Whilst no schemes of centuriation seem to have been set up in Roman Britain the existing landscape developed in a way which suited the imposition of military power and intensified arable production. Evidence for this is indicated by the large ladder enclosure and droveway settlements in East Yorkshire which survived from the late Iron Age only to undergo substantial redevelopment in the 3rd and 4th centuries where 'several rectilinear complexes see the construction of a single, large, broad-ditched enclosure' (*cf.* Giles 2007, 239). Indeed some of these settlements become associated with large villa estates, such as Rudston, presumably to reorganise and articulate the wider arable landscape. It may now be feasible to link the military garrisons of the north, and their surrounding open landscapes, cut through with highly-developed roads, and the developing rural estate centres. Not only were soldiers and ranking officials experiencing the Imperial influence on the landscape but also rural people who were living and moving from place to place with their cattle.

Figure 221; Illustration of the Piercebridge Plough Group from the fort at Piercebridge, County Durham, *c.*2nd-3rd century AD (from Manning 1971, 126).

The greater emphasis on cattle and the development of 'marginal' landscapes can be observed elsewhere. The fenlands appear to undergo considerable intensification, including the development of major drainage systems and, importantly, new drove roads for people and livestock to traverse the extensive watery landscape (Evans and Hodder 2007, 428-429; Mattingley 2006, 384-385). The area had been interpreted as an Imperial estate, exploited by the central Roman government (Potter and Jackson 1982, 118; Salway 1993, 190), though more recent theories argue that local, established populations were responsible for the increased use of the fens (Millett 1990, 120-121; Mattingley 2006, 384-386). Animal bone evidence from sites in the fens tend to support the increased 'Roman' cattle/arable hypothesis with Iron Age assemblages dominated by sheep remains (*cf.* Serjeantson 2006a, 214) shifting towards Roman-date assemblages with higher cattle frequencies (*cf.* Beech 2007, 435-436), though unfortunately the sample sizes from the latter period are small by comparison. The development of the fens continue in an area which was clearly used for arable production from the late Iron Age as is attested by numerous and widespread ardmarks in the soil (Evans and Hodder 2006, 254, 263, 282). What is certain are the differences in settlement pattern between the fenland area and the north of England in the Roman period (Evans and Hodder 2006; Giles 2007; Taylor 2007). Whilst the landscape was developing with an apparent increasing emphasis on cattle and arable agriculture in both regions, the layout and the aesthetics of each were very different. For people dwelling in these places, Imperial influences may have had an effect on the lives of both people and animals, though each developed from individual social histories with their own traditions and diverse cultural landscapes.

It is apparent that people living across the Iron Age and Roman transition were experiencing livestock in new ways due to the impact of urban and military settlement on the wider landscape. These can be seen as a direct link to the Roman Empire and we must remember that the people who dwelt within and nearby these places would have been influenced by this affiliation. Urban and military communities changed in character throughout the Roman period and the multi-layering of identities which existed in these settlements suggest that considerable differences existed in the ways each social group engaged with animals and the landscape. It is in this context that we now turn to people and places which developed specifically in the rural landscape.

7.2.2 Gardens

The concept of a 'garden' is a tricky venture for any archaeologist or historian. From a modern perspective gardens did not emerge in Britain until the Roman period. Such a space had not been conceived, as far as we know, by Iron Age Britons and the earliest examples of a feature which we would interpret as a 'garden' develops with the Roman villa. The large formal garden excavated at the centre of Fishbourne Palace, and therefore contemporary with the superstructure, places the construction of the earliest 'garden' in Britain at around AD75 (Cunliffe 1971, 120-134 - but refer to figure 2 in Chapter 4). Alongside this feature, a space of land leading from the south wing of the Palace towards the estuary and the developed deep-water channel was later interpreted as a southern garden on the outside of the Palace (Cunliffe *et al.* 1996). Here then, we have two gardens in one place before any others existed (in Britain). Once more, this seems to have been from knowledge imposed on the British landscape from the Imperial continent where similar features were already common amongst Italian villas of the 1st centuries BC/AD (Bergmann 1994, 49-50). However, whilst the idea of 'a landscape' is an essential ingredient in Roman gardens they were not 'landscape gardens' in the modern sense of the term (Purcell 1987, 187). The historical literature discusses Roman gardens in terms of how they represented the complex set of relationships between people and the natural settings where they lived (*ibid.*).

Aviaries were, in many cases, important components of high-status dwellings in Roman Italy (Pliny *Hist. Nat.* 10.72). Varro (*De Re Rus.* 3.5.6-9) notes that these features could exist inside and outside buildings of the estate and included a wide variety of bird species from small thrushes and swallows, ducks and hens, to large waders such as storks and cranes. It has already been noted in Chapters 3 and 4 that the frequency of wild birds species at Fishbourne was especially high, and that the comparative frequency of wildfowl remains on early Roman villa sites was considerably higher than at other types of rural site in Britain at the time (Chapter 6.3; Figure 199). The range of wildfowl species at Fishbourne is suggestive that the site included an aviary, particularly with the presence of thrush species and woodpigeon, but also the variety of wetland birds. The frequency of wetland birds from Fishbourne is considerably in excess of the national averages (Figure 222). The proportions represented by wildfowl specimens from the late Iron Age and late Roman phases are based on only a few fragments, though these are similar in relative frequency to the early Roman phase where a larger sample size is present. In each phase the Fishbourne frequencies are above 5% whereas the national averages are consistently below 2%, though an overall increase from the Iron Age to the Roman period can be observed. Whilst it could be argued that some of these birds could have been fowled as wild bird from the estuaries rather than being kept on site in aviaries, we need to consider what is actually meant by a villa estate.

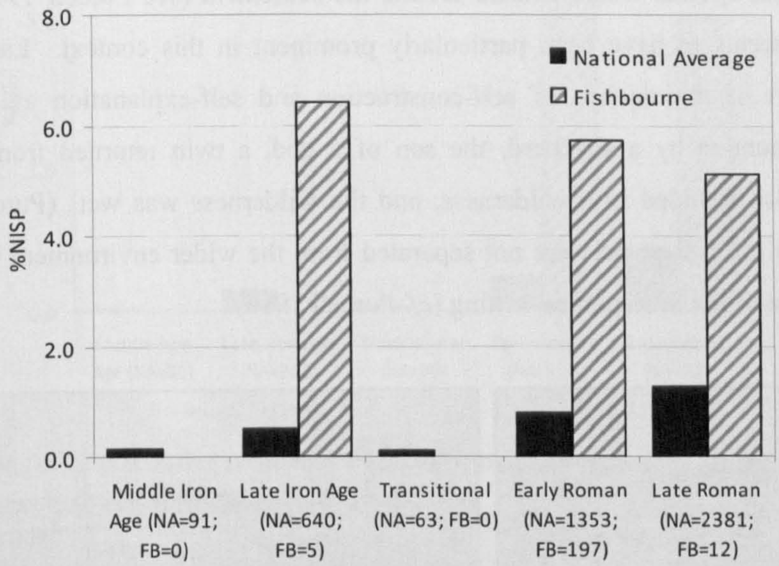


Figure 222; Relative frequency of wetland bird remains recovered from Fishbourne against national averages.

If you were to sit in the 'southern garden' of Fishbourne Palace in around AD80 and gaze out towards the harbour, the views you would see would not have been grossly different to that shown in Figure 223. The wider surroundings are occupied by grassy meadows, wetlands, and irrigated agricultural land, together forming an environmental mosaic to the local landscape and provide a variety of habitats for a wealth of animal life (Figure 223). The use of this area for situating a site such as Fishbourne Palace is likely to have been chosen specifically with its immediate landscape in mind. Watery places tend to have religious connotations at many high-status sites across the Iron Age/Romano-British transition and it seems that the local environment was a crucial component for developing settlements, as it linked people to their landscape through their socio-religious beliefs and worldviews (see Rogers 2008 for an excellent study here). Tacitus (*Ann.* 4.1) highlights the importance of the coastal landscape, including sights of the sea and the coastal wetland as parts of the villa estate. It was essential that these wider environments were available to display the productive nature of the settlement. Varro (*De Re Rus.* 3.2.14) notes in discussion of a villa 'for I have seen there large flocks of geese, chickens, pigeons, cranes and peafowl…' Such access to the wider environment would enable the villa owner to stock up inner spaces such as aviaries in the same way that granaries would be stocked with grain. Purcell (1994, 158) argues that this was essential for any elite residence – the image of production was not simply economic, it was the essence of high-status living. The increased proportion of wetland birds is not simply a result of Fishbourne being sited in an estuary, but that it was deliberately founded in this position to take advantage of the natural landscape and the greater quantity of animal species which existed around the settlement (see Purcell 1994). The watery landscape seems to have been particularly prominent in this context. 'Land-forms are as much part of the mythos of self-construction and self-explanation as are ancestors. Rome was founded by a shepherd, the son of a god, a twin returned from a maligned fate; it was also founded in a wilderness, and the wilderness was wet' (Purcell 1996, 180). The gardens at Fishbourne were not separated from the wider environment but were, rather, an extension of the local natural setting (*cf.* Purcell 1987).

Figure 223; Views looking east (left) and south (right) from the head of Fishbourne estuary showing the extent of the wetlands. Site of Fishbourne Harbour aisled hall villa is situated directly behind these viewpoints. Photos taken by author.

Aviaries were not 'shut-off' compartments within the villa but extended spaces which stretched out into the wider estate. The gardens however, seem to have been developed with the encouragement of wildlife in mind. The presence of ponds in the area immediately south of the Palace suggests that ducks, in particular, may have been encouraged into the settlement, if not directly husbanded. Varro (*De Re Rus*. 3.11) discusses the building of a duck-farm, which presumably could house any type of duck though he does differentiate between some species such as teal and coot. Varro (*De Re Rus*. 3.9) also argues that nets need placing over gardens for wildfowl in order to keep eagles separated from those inside. The relatively high frequency of mallard remains at Fishbourne (Figure 224), particularly in the 1st and 2nd centuries AD, may suggest that some wildfowl were purposely kept closer to the Palace grounds for visual pleasure.

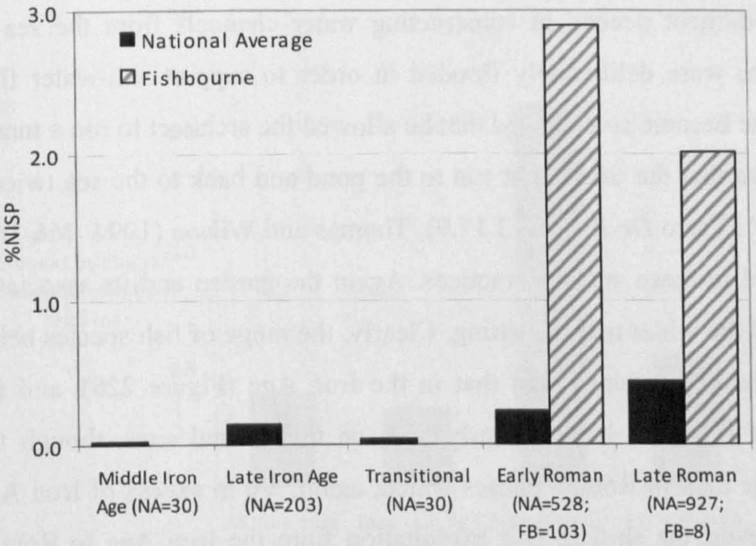


Figure 224; Relative frequency of mallard remains recovered from Fishbourne against national averages.

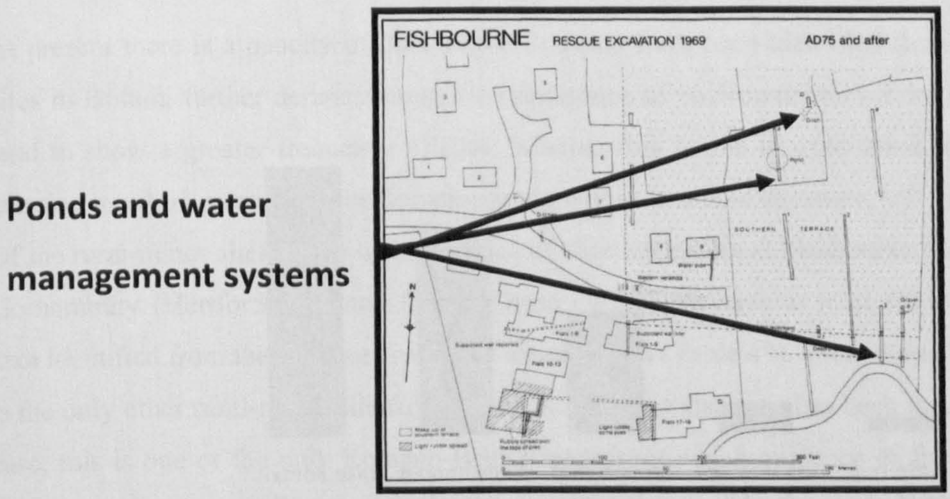


Figure 225; Plan of trial trench excavations in the southern garden at Fishbourne, FB69, with evidence for pond and sub-surface piping (after Cunliffe *et al.* 1996, 5).

Excavations south of the Palace showed that water management systems – underground piping – were built into the garden along with the ponds (Figure 225). The deep-water channel to the south of the southern garden was deliberately constructed to control and draw the water in from the estuary (*cf.* Cunliffe *et al.* 1996). The construction of fishponds on villa estates was common on continental villas of the 1st century BC/AD and many were constructed for keeping a variety of fish (Bergmann 1994, 50). According to Columella (*De Re Rus.* 8.16-17) the *piscinarii* of the late Republic are not to be seen as simply fanciful features but a deliberate elaboration of villa fashions. The development of coastal fishponds was integrated into the philosophy of the elite pastoral villa (Purcell 1994, 158). Varro (*De*

Re Rus. 3.17.2-3) notes that salt-water *pisciculture* was the reserve of the elite. This seems to have been due to the investment needed in constructing water channels from the sea or estuaries. Ponds in gardens were deliberately flooded in order to support salt-water fish. '…while he was building he became so enthused that he allowed the architect to run a tunnel from his ponds to the sea so that the tide might run to the pond and back to the sea twice a day and cool off the ponds' (Varro *De Re Rus.* 3.17.9). Thomas and Wilson (1994, 166-167) detail the logistics involved in these ancient practices. Again the garden and its associated features are an extension of the wider natural setting. Clearly, the range of fish species being exploited in the Roman period is greater than that in the Iron Age (Figure 226), and the presence/diversity index of fish taxa is particularly high on transitional sites, though the sample size is much smaller than in Roman phases which, again, are in excess of Iron Age phases (Figure 227). However, the shift in fish exploitation from the Iron Age to Roman period would suggest that fish may have been exploited in a variety of ways, and for a variety of reasons.

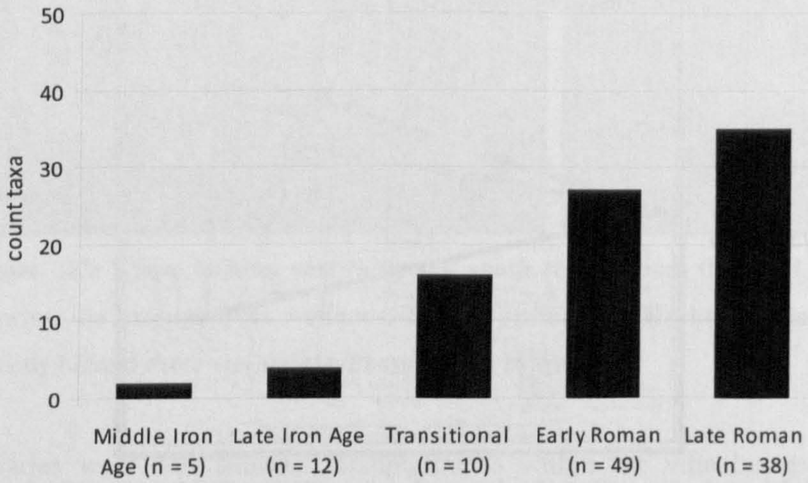


Figure 226; Count of individual fish species present in each phase on British sites.

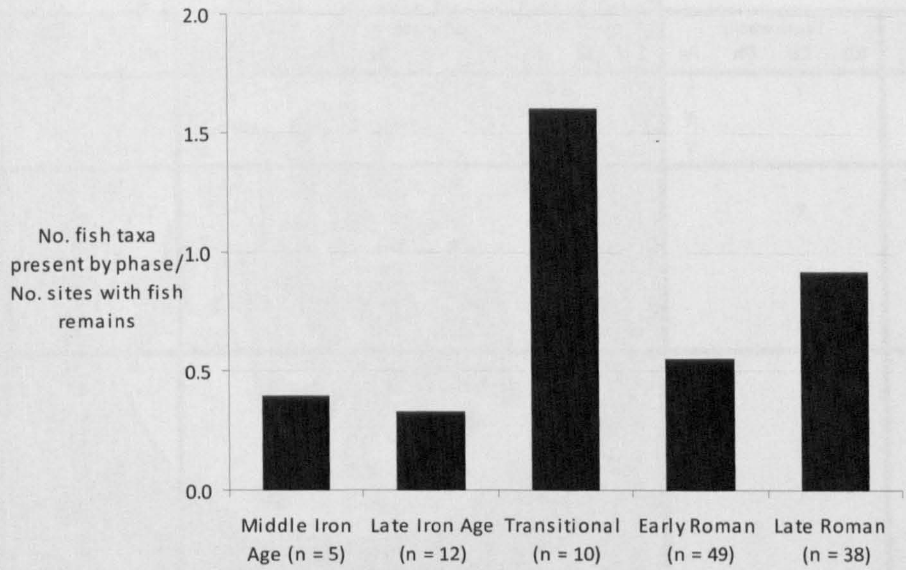


Figure 227; Presence diversity of fish species on British sites which include fish remains by phase.

At present there is a paucity of data where fish taxa have been identified from rural-minor sites in Britain, further demonstrating the importance of environmental sieving. Urban sites tend to show a greater frequency of data; whether this is due to excavation practices or a genuine trend of greater fish exploitation/trade within towns is uncertain (*cf.* Locker 2006). Of the rural-minor sites, those with evidence of elite settlement at Fishbourne (West Sussex), Gorhambury (Hertfordshire) and Castle Copse (Wiltshire) have at least four or more fish taxa identified from their respective faunal assemblages (Table 49). Great Holts Farm, Essex, is the only other rural-minor site from which at least four fish taxa has been recorded. In any case, this is one of the only Romano-British sites from which evidence of fish-ponds have been identified (see Germany 2003). The lack of evidence for ponds on Romano-British villas (and indeed other farmsteads) may be because excavators simply have not been looking for such features or have overlooked particular contexts. Late Iron Age farms only show evidence for strictly freshwater fish, in particular pike, whereas eel and herring seem to be the most common taxa on Romano-British rural-minor sites.

Phase	Site name	Freshwater				Migratory									Saltwater				
		Rh	Cd	Ph	Pe	Sn	El	Pc	Fr	Fh	Bs	Bm	We	Ht	Hg	Cd	Hk	Wg	Mt
LIA	Haddenham V - nv		Y		Y														
	Wardy Hill - nv				Y														
	Watkins Farm - nv				Y														
ERB	Dickson's Corner - nv															Y			
	Meppershall - nv		Y				Y								Y				
	Scotney Court - nv													Y			Y		
	Winnall Down - nv						Y												
	Fishbourne - el						Y			Y	Y	Y	Y		Y	Y		Y	Y
	Gorhambury - el		Y			Y	Y			Y					Y				
LRB	Great Holts Farm - nv				Y		Y	Y	Y						Y				
	Owslebury - nv						Y								Y				
	Shadwell - nv															Y			
	Yarford - vl					Y													
	Beddington, well - vl														Y				
	Bignor - el						Y												
	Castle Copse - el							Y	Y		Y	Y							
	Gorhambury - el						Y												

Table 49; List of Rural-minor sites where fish taxa have been identified and recorded (see appendix for references). Site codes: nv = non-villa farm; vl = villa; el = elite villa. Species have been separated into 'Freshwater', 'Migratory' and 'Saltwater'. Species codes: Rh = roach; Cd = cyprinid; Ph = perch; Pe = pike; Sn = salmon; El = eel; Pc = plaice; Fr = flounder; Fh = flatfish; Bs = bass; Bm = bream; We = wrasse; Ht = halibut; Hg = herring; Cd = cod; Hk = haddock; Wg = whiting; Mt = mullet

Many of the species identified from Fishbourne are at home in artificial ponds, particularly bass, mullet and wrasse (Wheeler 1969). These three species in particular are noted by Columella (*De Re Rus*. 8.17.7-9) to have been kept in ponds on the elite villa estate. The general exploitation of fish for food in the local hinterland, including Fishbourne, was extraordinary and rare (see Chapter 3). Gilhus (2006, 74) notes how land animals were controlled by domestication or the technology of the arena; fish however, belonged to a strange world, interacting with people in a limited manner (see also Purcell 1995). The place of the ocean in the mindset of the inhabitants at Fishbourne is immortalised by the renowned dolphin-cupid mosaic, a vision which suggests harmony between man and water and the creatures within (Figure 228). Whilst fish seem to have been actively avoided in the Iron Age (*cf.* Dobney and Ervynck 2007) their greater occurrence in towns in the Roman period suggests that people across the socio-economic spectrum may have come to think differently about eating fish (*cf.* Locker 2006). However, it may have been only at wealthy villa estates where *pisciculture* was actively carried out. So far, only Fishbourne has provided evidence of intensive reconstruction of the landscape in order to merge garden areas with the wider natural setting. This further demonstrates the attitudes of the inhabitants towards animals and the landscape as similar to those of the elite in Roman Italy.

Figure 228; Dolphin-Boy mosaic from the north wing of Fishbourne Palace.

The creation of the 'garden' has been seen cross-culturally as a means of demonstrating productionist ethics (Thompson 1995). '[G]ardens are, by their very nature, places where human beings work to transform the landscape' (Silvasti 2003, 146). This tends to be based on the idea that people believe to have an anthropocentric custodian relationship with nature. For Roman elite groups the boundaries between the garden and the wider environment seem to have been relatively fluid, maybe only delineated by land laws, but in ideological terms the garden stretched from the villa out to the wider environment in an attempt to bring the 'wild' under control. The difference between Fishbourne and the contemporary villas in Italy is that the latter were numerous, filling an already 'civilised' landscape. Purcell (1987, 200) cites the only known estate to have been developed in a 'remote and tremendous location', that of the villa at Sublaqueum, Subiaco, built for the Emperor Nero. The villa's architect damned the mouth of a gorge to form a lake which would back into the mountains creating a serene view from the house. 'One of the comforts and attractions of a villa in a place like this, apart from the summer cool, was the hunting' (Purcell *ibid.*). Clearly gardens were only one part of the villa estate.

7.2.3 Parks

Game animals are known to have been kept in Roman parks such as *vivaria* and *leporaria*, specially constructed spaces which were a fundamental part of the villa estate (Varro *De Re Rus.* 3.3.2; Columella *De Re Rus.* 9.1.4; Pliny *Hist. Nat.* 8.78). These places were developed so that the animals within could enhance the splendour of the villas, much in the same way that statues, mosaics, and frescos adorned the house and garden (Varro *De Re Rus.* 3.13.2-3; Columella *ibid.*). By the late Republic it was commonplace for wealthy Romans to have deer parks and game reserves on large estates (Starr 1992). Suetonius (*Dom.* 19) details the Emperor Domitian's attempts at displaying his hunting skills in his game park estate outside Rome. Tuck (2005, 244) suggests that by demonstrating his skills with a bow and arrow Domitian may have been creating Herculean allusion. Certainly, Domitian's association with hunting is known from his adoption of Hellenistic imagery – an Imperial trait which lasted until the 4th century AD (Tuck 2005, 244-245).

The array of wild animals present at Fishbourne and the high frequency of deer and hare have already been demonstrated in detail but are again shown here in comparison with national averages in Figure 229. Zooarchaeological evidence for wild boar has also already been proposed in Chapter 3. The evidence suggests substantial exploitation of local wildlife. Fishbourne has previously been identified as the location of a Roman park by Sykes (*et al.* 2006b, 954-955) after the presence of live fallow deer herds had been established. Sykes (*ibid.*) placed the park in the region of the southern garden though, as I have suggested from my spatial analysis (Chapter 4), a more likely location was to the north and west of the Palace where evidence for outdoor summer eating and enclosure areas have been identified. As discussed already, the southern garden better fits the area for wetland fowl and fish ponds. As fallow deer were recorded as being kept on parks in Roman Europe their presence as a live herd within an enclosed estate at Fishbourne is wholly acceptable (*De Re Rus.* 9.1.1).

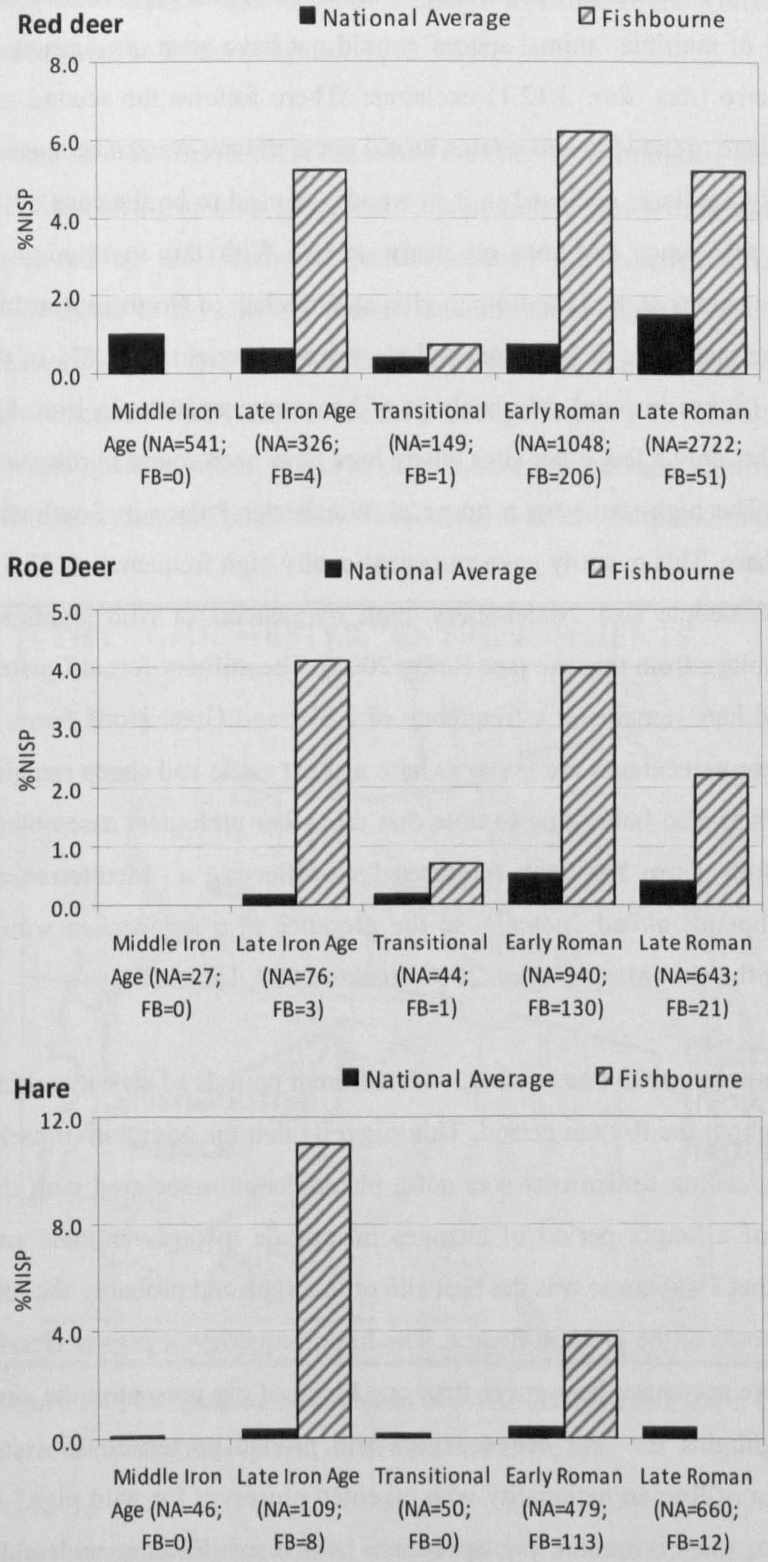


Figure 229; Relative frequencies of red deer (top), roe deer (middle), and hare (bottom) from Fishbourne against the national dataset by phase. Note that antler specimens have been removed where possible and the Iron Age assemblage from Fishbourne only includes the small sample from the Iron Age ditch context.

The high frequency of hare in Fishbourne's assemblage may also suggest the presence of a *leporarium*. The existence of multiple 'animal-spaces' would not have been uncommon on the most elite villas as Varro (*Res. Rus.* 3.12.1) exclaims: 'There follows the second act, which is usually an appendage to the villa and retains its old name of hare-warren because of one part of it – for not only are hares enclosed in it in woods, as used to be the case on an acre or two of land, but also stags and roes on many acres'. With this in mind, it is noteworthy that recent excavations at the Late Roman villa at Whitehall in Northamptonshire have yielded similarly large quantities of hare bones: their remains account for 2.8% of the total mammal assemblage (Sykes in prep). My analysis of hare representation in Iron Age and Roman Britain highlights only a few other sites where hare have been found in relatively high frequencies on sites. The high-status town house at Winchester Palace in Southwark produced 30 fragments of hare. This quantity gave an exceptionally high frequency of 17.7% within an admittedly small sample size. Nonetheless, high frequencies of wild mammals were a feature of the assemblage from this site (see Reilly 2005). The military fort at Caister-on-sea in Norfolk, included hare remains at a frequency of 2.8%, and Great Holts Farm in Essex (2.9% - note that these percentages are given as hare against cattle and sheep remains from the respective sites). It is also interesting to note that the wider biological assemblage from the villa at Great Holts Farm has been interpreted as reflecting a 'Mediterranean lifestyle' – as with the fishponds already noted – so the presence of a *leporarium* would certainly fit the character of the site (Murphy *et al.* 2000; Locker 2007, 150).

These sites were not contemporary with one another, with different periods of activity taking place at various sites throughout the Roman period. This suggests that the adoption of parks as a landscape feature surrounding settlements was not a phenomenon associated with the Roman conquest but part of a longer period of changes in attitude towards animals and landscape. It is very likely that Fishbourne was the first site of this type and probably the one to carry out continental customs to the greatest degree. The high frequency of pigs is clearly a feature of this site and there may have been more than one breed of pig present at the site. Pliny (*Hist. Nat.* 8.79) highlights the link between pigs and private preserves: 'Fulvius Lippinus was the first person of Roman nationality who invented preserves for wild pigs.' It is difficult to know whether the Fishbourne pig specimens which exhibited considerable metric differences from the main population derived from a locally-procured 'wild' boar, indicating that separate herds of wild pigs were roaming the woodland surrounding (or within) the estate or whether these animals were especially imported to the site for a hunt. The fallow deer evidence clearly shows that animals were imported to Fishbourne to be emparked. The transport of beasts around the Empire for enclosure in private preserves is well-known (Epplett 2001), and it is reported that varieties of pig, such as the African warthog, which seems to have been thought of as exotic in the Roman world, were captured and transported to Rome (Toynbee 1973, 134).

Varro (*De Re Rus.* 3.12.2) describes the exceptional hunting preserve of Titus Pompeius in Gaul enclosing an area of around 4 square miles. This area is comparable in size to the space enclosed by the Chichester Entrenchments, the complex dyke system which surrounds Fishbourne to the north of the site and similar to those at other late Iron Age oppida. The earthworks of the Chichester Entrenchments have been recognised to have begun construction in the late pre-Roman Iron Age (Bradley 1971, 30). Fishbourne Palace sits in a central position within this area of land, and it is perhaps significant that late Iron Age/early Roman settlement, other than Fishbourne, is absent from within this area (Russell 2006).

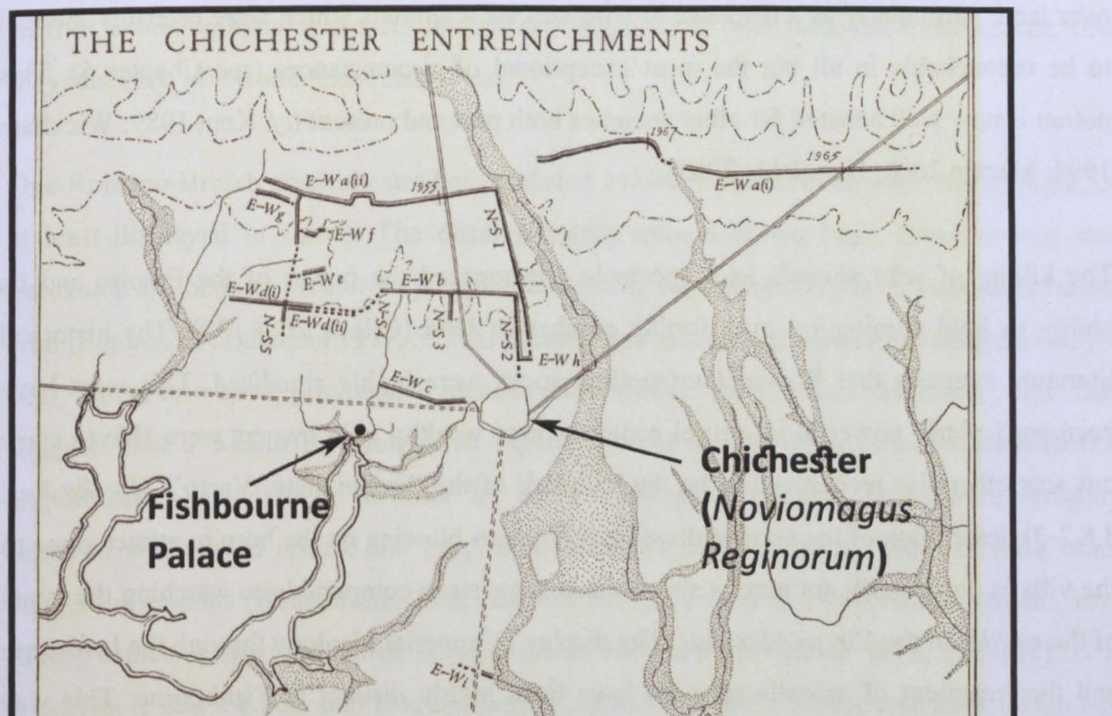


Figure 230; Geographic relationship between Fishbourne Palace, Chichester and the Chichester Entrenchment dykes system (after Cunliffe 1971, 20).

Parks are generally concerned with private, or restricted, display (Ritvo 1987, 233-242). We must remember that villas were designed to impress visitors (Scott 2004, 53). Roman animal parks were not simply for hunting, but so that animals could be watched in a 'natural' setting and for the spectating of hunting displays. These spaces, and the hunting carried out therein, were powerful demonstrations of wider idealism. Lorimer's (2000, 403) account of deer-stalking by 19th century elites in Scotland indicates that the act draws 'humans, animals, technologies, science, localised history and popular memory' together by associating custodianship and tradition with landownership. Access to wild animals provides an indication of the estate surrounding Fishbourne. Rather than land simply being seen as being owned, landownership may instead have been conveyed through access to animals. Rules of ownership did not coincide with possession when it came to domesticates (McLeod 1989, 169-176). Cattle, for example, would have been the property of the legal owner even if they were not in physical possession of the animal. If a cow escaped and caused damage to another person's property then the owner would still be liable (Starr 1922, 438). Indeed livestock were stolen from Roman farms. Written curses on tablets demonstrate the anger felt by people for their lost animals (see Mattingley 2006, 311-315). Wild animals, conversely, were *res nullius*, meaning the property of no-one. In this case, an animal becomes the property of a person who takes physical possession of it, known as *occupatio* (Kaser 1940). Hunting, therefore, becomes an extremely powerful expression of domination over land, particularly as a response to wild species – animals which were probably thought to be untouchable in all but the most exceptional of circumstances (see Chapter 6). This notion is now well attested for other societies both past and present (*cf.* Kent 1989; Wickham 1994; Marvin 2000; Hamilakis 2003).

The killing of wild animals as a spectacle presupposed the power of the Empire and its ability to hold domination over further reaches of land (Gilhus 2006, 32). The historical literature suggests that Roman hunt performances were highly ritualised. This must have been particularly powerful in a rural context where wealthy villa owners were able to carry out acts otherwise recognised to be the hallmark of the Roman state. Varro's (*De Re Rus.* 3.8.2-3) description of the servant dressed as Orpheus blowing on the horn to attract game to the villa is particularly apt here; a show Varro suggests is comparable to watching the hunts of the *aediles* in the *Circus Maximus*. The display of imperial ideology through the landscape and the treatment of animals seem to have been highly distinct at Fishbourne. This was demonstrated through a private preserve on a royal estate. It is now necessary to consider how this ideology became transmitted to the general population.

7.2.4 Amphitheatres

Animals became a major part of the Roman arena spectacles, according to Dio Cassius (43.22-23), around the time of Caesar. Welch (1994, 72) argues that gladiatorial shows were important in promoting *virtus*, military courage, which was a major component in Roman self-perception. The number of amphitheatres in Britain is few by comparison to Roman Italy and Gaul (Mattingley 2006, 282). They are always associated with either urban centres (*cf.* Down 1989; Fulford 1989) or military sites (Zienkiewicz 1986). Some were placed outside towns walls, or rather town walls were developed in the later Roman period separating the town from its amphitheatre, as at Silchester (see Creighton 2006, 139). Or, the amphitheatre became part of the developed urban grid system which placed it at the heart of town life, as in London (see Creighton 2006, 104). They are best known for the use of wild animals in gladiatorial displays, and in staged hunts: *venations* (Welch 1994). However, few have been systematically excavated in Britain (though see Fulford 1989) and even less have produced reliable zooarchaeological data. Grant (1989) has published the animal bone excavated from the Silchester amphitheatre, though this sample was remarkably small and seemed to have been redeposited from waste originally outside the amphitheatre. That said, Grant (1989, 137) remarks on the relatively high frequency of horse remains in the assemblage and notes that their high frequency over cattle and sheep (the only other animals represented) may pertain to activities associated with the amphitheatre. It seems likely that wild or exotic animals, if present in displays, would have been removed from the site after they had been killed and taken elsewhere.

One Romano-British amphitheatre has produced evidence that wild animals were fought, or at least displayed in shows. The distal humerus from a brown bear, *Ursus arctos*, was excavated at London's (Walbrook) amphitheatre from a contemporary layer outside the arena wall (Figure 231; Bateman 1997, 58). At present, this assemblage awaits full analysis and the bear humerus was a provisional identification (Sidell pers. com.). However, this find suggests that a wealth of information regarding wild animal displays in Romano-British amphitheatres is yet to be unveiled by zooarchaeological analysis. Bears were certainly captured and moved around the Empire for displays and for staged hunts as were other dangerous animals (Bomgardner 1992; Epplett 2001). A surviving pavement fragment from Radez depicts a sparring match between bears and boars (Toynbee 1973, 133-134). It is conceivable that the boar and bear specimens represented in the Fishbourne assemblage had both been imported to the site from elsewhere, particularly considering the otherwise complete absence of these species from other sites in this region throughout the period. When a few animals such as these are transported for 'special' one-off events they were usually regarded as individuals in their own right and imbued with personal status. On the venatio mosaic at Cos, three boars are named 'Gorgonis', 'Polyneices', and 'Solon', whereas two bears are named in a pavement from the House of the Peacock at Carthage as 'Crudelis' and 'Omicida' (Toynbee 1973, 97, 134).

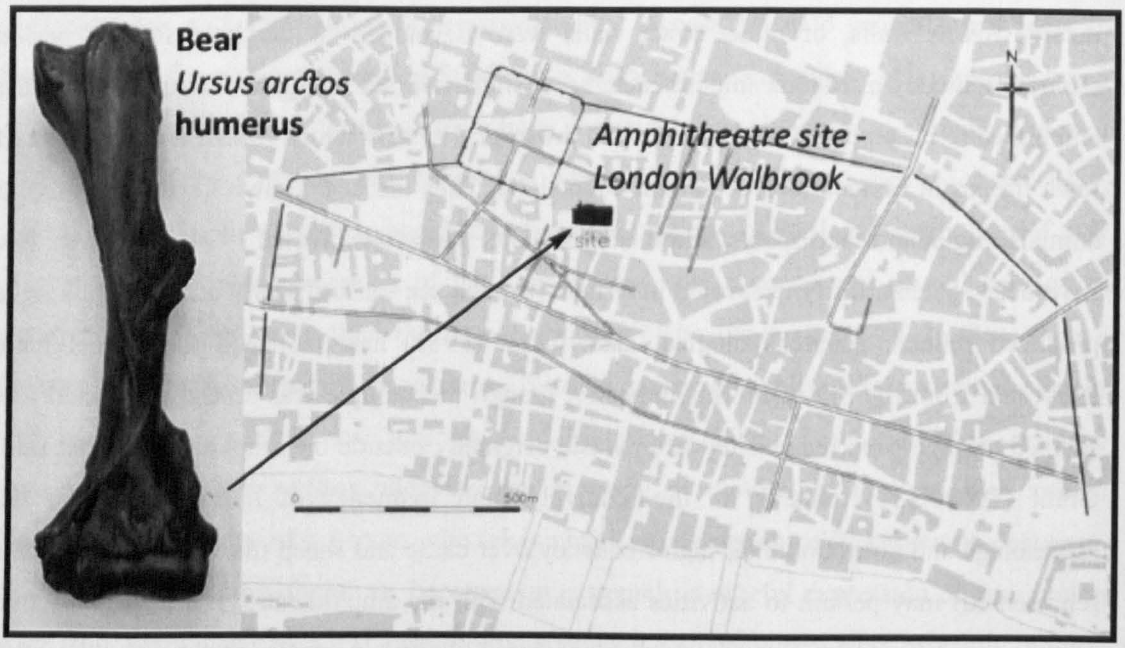


Figure 231; Bear *Ursus arctos* humerus and the location of the Walbrook amphitheatre in London (modified after Bateman 1997, 52). Please note that the humerus displayed here is not the one recovered from the Walbrook site.

Further to the bear humerus recovered from the London Walbrook amphitheatre, the skull of an unusually large bovid was excavated from one of the perimeter drains of the amphitheatre. Anderson (1985, 141) has noted that cattle and sheep were tied up as bait for more fierce animals, and Bateman (1997, 62) has suggested that a large post-hole in the centre of the London amphitheatre may have been a post for tying animals to. Furthermore, Grant (1989, 138) has suggested that in the absence of the exotic wild animals from Silchester – those which were put on display in Rome – domestic bulls may well have been used in their place. There is a large bull depicted in the Venus mosaic at Rudston Roman villa, Yorkshire, which looks to be in an 'attack-stance' with the words: *Taurus Omicida* beside it (Figure 232; Stead 1980, 134-135; Plate XIb). These have been translated as 'the man-killing bull' or 'the bull named homicide' (Toynbee 1973, 150-151). On other areas of this mosaic are depictions of wild animals and a *bestiarius*, a professional hunter, and it is in little doubt that *Taurus Omicida* was part of a *venatio*. Bulls and bullfighters were known to have fought in Roman amphitheatres from inscriptions in Pompeii and other written records (Toynbee 1973, 149). Pliny mentions the Thessalian race killing bulls by galloping a horse beside them and twisting back the neck by the horns; this was a display which Julius Caesar put on in Rome itself (Pliny 8.70.182). Many post-medieval bullfights were for the display of fine horsemanship and had a military overtone, such as *juegos de canas* which was similar to jousting and the aristocratic fighting of bulls on horseback (Shubert 1999, 18).

Figure 232; Depiction of *Taurus Omicida* from the Venus mosaic at Rudston villa, Yorkshire (after Stead 1980, 134-135).

During late Imperial Italy, the amphitheatre in Pompeii was constructed during a period of political tension between the native aristocracy and Sullan colonists, veterans from Sulla's army in the early 1st century BC (Welch 1994, 60). It was paid and built by Quinctus Valgus and M. Porcius, who were the chief magistrates of the colony (known from inscriptions) and were probably military men – *tribunes* (Welch 1994, 61). Welch (*ibid.*) also argues further the connection between gladiatorial games and veteran colonisation. A charter from Urso (a Roman colony in Spain – 44BC) indicates that the town magistrates must pay, from their own funds, for a public show to be dedicated to the Roman state's gods, Jupiter, Juno and Minerva. It is apparent that Roman amphitheatres, where they existed and where animal shows were put on, were a demonstration of imperial philosophy. The majority of late Republican amphitheatres constructed outside Rome were done so in settlements which had known veteran colonies (Welch 1994, 66-67). Also many of the gladiatorial schools in Capua, Southern Italy, were owned, not by the Campanian elite, but by noble families (Welch 1994, 69). It was Roman aristocrats who disseminated the amphitheatre culture during the late Republic and early Empire. By controlling the games as an economic resource, the political power and dominance of Rome could be displayed in places far from the City.

Wild animals were used by the senatorial classes in strident displays of power for the urban masses (Carandini 1982, 71; Scott 2004, 46). Experiencing the *venatio*, the 'beast-hunt', may have been an opportunity for provincials to step, conceptually, closer to Rome, to the civilised ideal. But in doing so they could also move towards the 'edge' of the world in ideological terms, to experience how Roman civilisation could act as protector against the 'outside', where disorder and chaos ruled. In this sense, the *venatio* acted as propaganda creating, not only a perception of otherness, but also a fear of it, in turn generating loyalty to Rome in local populations. The literary tradition creates a 'them' and 'us' scenario, and by creating an arena for performance, a re-engagement between 'civilisation' and 'wilderness' can take place. Cartmill (1993, 31) has suggested that hunters are not simply fighters on the side of humanity against wilderness but instead are divided between the two. The hunter stands on both sides of that boundary and becomes liminal, as do the animals that are interacted with. This performance then, not only takes place within liminal spaces, but actively creates them through the practices of the participants. The amphitheatre provides a useful context to the role of parks and gardens at Fishbourne and other Romano-British villas, in the move towards imperial domination over nature by humanity; an action deliberately lead by the elite groups and displayed, fundamentally, within the landscape.

7.3 Summary

The examination of these animal spaces – gardens, parks, and amphitheatres – has provided evidence that they developed in Britain as a response by the elite groups to demonstrate imperial power in a newly conquered province. The quantity of these spaces found so far is minimal compared to those found in Roman Italy and to some extent in Roman Gaul (*cf.* Woolf 1998). It seems that in only a few rural places did elite groups find it appropriate to display such powerful messages of Empire. Indeed, Fishbourne is the only site which, as far as we know, takes this to a level only matched in Roman Italy (*cf.* D'Arms 1970; Purcell 1994).

The main point which has risen so far is that the spaces themselves were given meaning by the human-animal interactions which took place within. Indeed, they created those places. I have suggested that these changes are bound up with Imperial ideology. There is a clear desire to integrate villas with their wider environment (Scott 2004, 53). We can see similar shifts in Victorian England where pioneering naturalists were frequently avid adventurers seeking out and objectifying distant lands so that they could be transported back home to be viewed and admired (Ritvo 1987, 111). If gardens and parks were places where imperial ideology was demonstrated in a rural context, then amphitheatres were the arenas of imperial expression to urban audiences. But we must not forget the other animals which lived in and moved through Roman towns on an everyday basis in that they had an equally, if not greater, psychological impact on the people who lived with them. The presence of domestic fowl in urban settlements was part of what made a town a 'town', every bit as much as the forum-basilica or the aqueducts. In this sense, we must not neglect the importance of urban animals which were not so heavily ritualised in the arena such as rats, pigeons and dogs.

Moving an animal from one environment to another can change the meaning of that space; it can create a new place. With cultural change comes environmental change and although towns are constructed to accommodate humans, they also become animal spaces. These animal spaces can shape the way in which towns, and indeed other types of settlement, developed in social and economic terms. Iron Age communities would have had to make a choice as to whether they conformed to this change, or instead resisted new customs in favour of tradition. Roads, and the animals which travelled along them, had the effect of expanding cultural landscapes. Cultural change was obviously far more complex than a simple adoption of customs; and the integration of zooarchaeology and animal geography shows that this change was manifest in the Romano-British landscape.

Perhaps more fundamental, it seems to me, is that the construction of these places say far more about how imperial appropriation of land is conveyed. Whilst in some provinces grand schemes of centuriation were needed, in Britain the development of villa estates, with their wider landscape features and custodial 'ownership' over the natural setting, were more appropriate. These were not isolated projects: they were linked to towns and forts by the extensive road network. It is quite possible that the idea of landowning did not exist in Iron Age Britain or was only developing in the later period when oppida began to flourish with greater contact with continental Europe and the Roman Empire. Instead 'land' was represented by animals in the Iron Age, through herds of cattle and flocks of sheep. The Roman state seems to have recognised the importance of this ideology to the Iron Age population because historical records detail that whole herds were taken by the Roman army from defeated tribes to displace their wealth (Toynbee 1973, 162). The Iron Age/Romano-British transition involved a large-scale Imperial conquest, one which altered the ways land was quantified and used, and in terms of the natural world in the ways that it was perceived.

Chapter 8: Human – Animal – Landscape Relationships: new perspectives on the Iron Age/Romano-British transition

The Iron Age/Romano-British transition is commonly held to be a pivotal turning point in British history, and, academically, it has often delineated where some research ends and others begin. This is well illustrated by the work of Creighton whose research has been at the forefront of recent and highly informative illuminations of the transition but whose books focus on the 'Iron Age' part of the transition (2000) and the 'Roman' part of the transition (2006). Yet Creighton (2006, 1) himself has clearly argued that the transition was not a clear cut shift in culture and economy over AD43 but a combination of changes which transcend a much longer trajectory embedded in a variety of social processes. This, at present, is the largely accepted view of the transition by most academics working in this field (*cf.* Hingley 1989; 2005; Millett 1990; Mattingley 2006). The aim of my thesis has, in a sense, been two-fold. One focus has been on the period under examination, with the changes and continuities which may have taken place and the constructions of social identity those processes generated. The second has been to view the transition by examining faunal remains in a novel but methodologically repeatable fashion; that is to interpret animal bone data in terms of social practice rather than simply in economic paradigms. The main subject of my thesis has been to examine these two aims together within the encompassing theme of landscape. To reach my main objectives I set out with the hypothesis that people, animals and landscape work together to create culture. Through a synthesis of a very large animal bone dataset and by incorporating evidence from Iron Age and Romano-British material cultures, ancient history and social anthropology I argue that new perspectives of the Iron Age/Romano-British transition have been gained.

8.1 Animals, Space and Iron Age Society

As a springboard to address the wider issues of this thesis, I undertook a detailed (re)analysis of the zooarchaeological assemblage from Fishbourne Palace: the act of making the data from this site available is, I hope, a contribution in its own right. In order to examine the material from a landscape perspective I produced a detailed spatial analysis of the faunal remains and associated material culture on a scale rarely achieved on a site as complex as Fishbourne, both in terms of its considerable development from the 1stC.BC-3rdC.AD, and in the discontinuous level of excavation carried out at the site between 1960 and 2002: a history which has generated a composite archive that is difficult to both navigate and integrate. It is unfortunate that the Iron Age data from Fishbourne is currently restricted to a single ditch and a few contemporary deposits from another area of the site. For my spatial analysis, it was therefore necessary to extend the contextual examination beyond the site so as to place the Iron Age features in the wider milieu of the period. However, from this perspective it was possible to extrapolate an abundance of information about the earliest phase of development at Fishbourne. It showed evidence of both continuity and change in terms of the ways people were engaging with animals and landscape. Structured deposition of animal skulls seems to have been a relatively common practice in the Iron Age. I have argued that this custom was tied to Iron Age identities but also in the creation of spaces on settlements and in regions. Each part of an animal was reflective of the person or people to which it was allocated and their place in society. Domestic animals here seem to have been representative of land, which is perhaps unsurprising given that the anthropological literature is consistently providing examples of animals being used for displays of inter-community relations, with the distribution of the animal reflecting a range of different social ties, obligations, negotiations and exchanges (Herskovits 1926; Evans-Pritchard 1951; Galaty 1982; Reay 1984; Osborn 1996; Sillitoe 2001; Abbink 2003; Smith 2005). The faunal evidence from Iron Age Britain suggests that similar social activities were taking place. Domestic animals do not seem to have been moving through market-driven networks which we are more familiar with today. People and livestock had a far closer association with their shared landscapes, ones they experienced together on a daily basis.

The Iron Age ditch at Fishbourne included skulls, but it also included wild mammals and fish, animals which were, in general, rarely exploited in the Iron Age. However, there remains occur with unmistakable frequency on Iron Age hillforts – not in large quantities which might be expected in 'normal' exploitation, but in occasional practices, seemingly outside the normality of daily life. Haddenham V was one site where wetland birds, mammals, and fish were exploited with regularity. I have suggested that this evidence along with its position within the Fenlands places the site in the wilderness of Iron Age Britain. Similar exploitation practices were taking place at Fishbourne, but in a new context and, importantly, in the Iron Age ditch we have the incorporation and integration of different cultural traits. Haddenham V did not produce the quality and quantity of Mediterranean imports that the Iron Age ditch at Fishbourne included. Whilst Haddenham V may have represented the 'outside' for the Iron Age communities in and around the Fens, the activities at Fishbourne suggest that it was the continent, probably the Roman Empire which represented the outside world.

The animal bones in Fishbourne's Iron Age ditch, despite including remains of animals which were part of rare activities in the Iron Age (hunting and fishing), actually represent a level of continuity where such practices, though infrequent, had a long history as acts associated with select Iron Age sites, involving a high degree of social importance. Creighton (2006, 157) suggests that altering power structures across the transition caused the memory of traditional customs to be reformed and remodelled with new foundation myths. Again, I refer to Purcell's (1996, 180) quote referring to the origin myth of Rome being found in the wilderness, in the wetlands (Chapter 7.2.1). Fishbourne was a 'new' place in the late Iron Age, one at the head of an estuary, where wild resources were being exploited, and where important socio-political structures were (re)forming. Fishbourne sat in a liminal space between Britain and the continent; between the British aristocracy and the Roman Empire; between civilisation and the wilderness. It marks the Iron Age/Romano-British transition in ways that few other sites are capable. The Iron Age ditch is only one feature, but, I argue that when we view contexts outside of traditional zooarchaeological formats, against a broader historical background we can glean a considerable amount of information. In this single feature we have a complex range of interactions which link people, animals and place. It incorporated identities and memories. But its significance also raises the question of just how much information we are currently missing from Iron Age Fishbourne. This was a site which later developed into the most elite residence known from Roman Britain. We have but a glimpse of its Iron Age landscape and the important role it played across the transition in the region, and in Britain as a whole.

8.2 Fields to Market

The transition into the Roman period is marked by a number of considerable changes. Firstly, the social importance of animals needs to be viewed against the economic developments of the period and the growth of urban and military sites. We see these places as consumer sites with domestic livestock being moved towards them on a regular basis. My data suggest that this situation did not emerge instantly however but developed over time. Cattle ageing indicates a gradual move towards a structured market economy, eventually creating a stark contrast between 'producer' and 'consumer', 'rural' and 'urban', in the late Roman period. This economic perspective is important for highlighting a number of points.

Firstly, the social role of production is vastly overlooked in zooarchaeological studies. The ownership of a farm weaves strong emotional ties between the family and the land (*cf.* Segalen 1987). A farmer's relationship with nature is determined by the significance of agriculture for people, as Silvasti (2003, 143-144) points out, this is based on the principle of production. Varro's illuminating stories in the third book of *Res Rustica* explain the importance of villas as being visibly burgeoning with animal life so that the productive and storage capabilities of a residence implied elitism. A villa farm was intended to be seen as a place of production, ready to send its accumulations of animal life out to the consumer world of the town and the fort. Again Fishbourne was a forerunner in this perception of the productive landscape. From a very early phase, neonatal pig and sheep/goat remains were being recovered at the site in relatively high proportions. The presence of neonates is a prerequisite for claiming the presence of animal breeding on settlements. This is particularly important for our understanding of the outward concerns and the image of the settlement and its inhabitants. Traditionally perceived to be a consumer site, Fishbourne was labelled by previous zooarchaeologists simply because it was high-status, giving the impression that it was a 'stately home' in the early modern sense. The image of production and storage of villas seems to have been romanticised by the Roman agronomists. Purcell (1994, 170-171) highlights the visibility of the workforce and the forecourts of the great Italian and Gallic villas. My spatial analysis at Fishbourne has shown that a great deal of activity was evident in front of the main buildings, both in the pre-Palace and Palace phase, such as the barn and areas where livestock were herded north of the proto-Palace, or the roads with remains of cart tracks highlighting continual traffic to and from the Palace in the direction of Chichester.

There is no reason why Fishbourne should be seen any differently to the productive villas on the continent and the imperial idealism which surrounded the concepts of production. Another important aspect is the identification of different seasonal spaces for consumption. I have argued that deposits in front of the Palace are representative of animals killed and consumed in the autumn/winter months, whereas the kitchen garden area at the rear of the Palace seems to have been a focus for outdoor summer-dining. A high frequency of pig, chicken and mallard were consumed there, along with smaller amounts of wild animals. Pigs and chickens were bred and reared on site, and the ducks and wild animals probably lived on the estate also. I have suggested that we must consider the wider landscape in these actions. The role of animals could be manifold in this context, not only in being eaten but at the same time being watched. This much is drawn from the historical evidence, but it is a clear link between the bounty of the estate and its consumption. Metaphorically, the inhabitants and visitors were consuming the landscape through its animals via taste, touch, vision and sound. We may also include smell here as the meat was seemingly cooked in the nearby ovens, providing a further link between the field and meadow and the dining table. Landscape was therefore not something simply seen, but a performance which filled the senses in many ways through the media of animals.

Different areas relating to specific activities involving animals have been identified at Fishbourne. The stages of production, killing, distribution, consumption, and deposition are clearly passages of time but, I suggest, are *expanded* in a spatial dimension over the settlement. Areas of animal killing is one area which is very difficult to elucidate, and consequently is an understudied area of zooarchaeological analysis. At Westward House an area of carcass dismemberment is evident, presumably for the production of raw materials. Cattle horncores and foot bones are over-represented and a number of wild animals, including bear, fallow deer, and badger are present, which together is likely evidence for skinning. The wild animals are unlikely to have been killed in this area, but there is a possibility that cattle were driven in for slaughter and primary butchery. If this was the case, the sight and sound of animal death in this place would have had considerable affects on those moving through the area. Indeed, Westward House was situated along the main road between Fishbourne and Chichester. People would have had to pass through the area to travel to the site. The visual act of dismembering animals seems to have been important elsewhere. The 'horse pit' to the north east of the Palace included the deposition of a horse, as its name suggests. Cut marks on the remains indicate that the dismemberment and deposition of the animal was carried out with considerable care and may represent an animal with close social connections with the inhabitants at the site. The different places where animals where being buried and the methods by which they were dismembered involved explicit meanings expressive of the relationships of the animals to the people and the settlement. The role of horses I have argued in Chapter 6.1 was intimately linked to perceptions of nature but also to the appropriation of land and developing social structures.

8.3 Land, Power and Identity

Another point which has risen from the evidence so far is that the concept of landownership fundamentally developed across the Iron Age/Romano-British transition. The dramatic overhauls of the landscape seen in other provinces did not take place in Britain. The evidence also suggests that the animal economy did not alter dramatically at the point of AD43. But there were long term shifts from sheep rearing to cattle farming, as well as more subtle manifestations of imperialism, such as the introduction of parks, gardens, roads, amphitheatres, and the deliberate exploitation of the wetlands. Human-animal relationships were an integral and essential part of these transformations.

In the Iron Age, land was represented through animals, through herds of cattle and flocks of sheep. As seen already, I have argued that this representation was embodied in the killing, redistributing and depositing of livestock. The wild by contrast, could not be owned. With the known shift towards cattle husbandry and the development of the market economy over the transition it seems that livestock were no longer a primary means of negotiating and exchanging between different social or ethnic groups as they were in the Iron Age, instead becoming part of linear movements between countryside and town. People were now to a greater extent only engaging with livestock either at production or consumption though rarely both. Livestock in this sense did not represent land to the same degree as it did in the Iron Age, being intimately tied up with social identity. Instead, I have argued that landscape and identity needed to be expressed in a new way: hunting. This I suggest is what accounts for the increased frequency of hunted animals recovered from early Roman villas.

There has been a long held belief that exploitation of wild animals increased over the transition in general. My data have indicated that this was not the case (though fish probably were). Wild animals were not exploited in a greater frequency overall in the Roman period; the focus of hunting activities and its associated meaning had changed. As seen, attitudes towards wild animals are commonly bound up with religion and in the Roman period this probably extended to imperialist ideals. I am now coming to the conclusion that the association of imperialist ideals was not the motive for hunting but a legitimisation of the act (though Fishbourne may be a separate case). The increase in hunting was more fundamentally ingrained in new ideas about, and a restructuring of, landownership and elite society in early Roman Britain. Many modern writers have noted the relationship between hunting and kingship or elite society and where cultural contacts take place: hunting methods and ideas change within new political contexts (Lane-Fox 1996; Helms 1993, 84; Hamilakis 2003; Wylie 2007, 121). My argument is that across the Iron Age/Romano-British transition hunting increased as a method of demarcating the elite landscape and notions of property.

The introduction of Roman law may have had an influence here. This demonstrated the interchangeable nature of animal definition where, initially, there was a clear difference between wild and domesticated animals. Certainly the distinction between 'wild' and 'domesticated' seems to have been linked to the economic importance of animals (Frier 1982, 105-14). The concept of *res nullius* (see Chapter 7.2.2) reinforced the idea that people could take what they wanted from nature as long as they did not take anything from other citizens. It is important to remember that whilst different social groups categorise elements of the world around them, of which animals can be placed in physical and metaphorical terms, those boundaries are fluid and adjustable. We know that the status of animals in the Roman period was ambiguous, as is described in a passage from Gaius (*Digest* 41.1.5.5; see also Starr 1992, 438), which implies a somewhat passive approach to the ownership of *wild* animals based upon the natural behaviour of the species in question. The notion of *revertendi* *animum*, or the 'consciousness to return', holds that whilst certain animals were thought of as wild, their willingness to return to the places of human habitation brought them back under the auspices of the landowner. The difference between Iron Age and Romano-British perceptions then could have been that people felt that they could demonstrate ownership over the wilderness; an awareness which was unthinkable in the Iron Age. Villa estates, as new architectural forms of landscape, embodied expressions of land ownership, a point which was now emphasised by the high frequency of hunted species found on some early Roman villas.

As one of the oldest institutional contexts of human-animal relations, the hunt was a fundamental part of the Roman arena, be it in the amphitheatres of the urban provincials or in the game parks of the rural elite. Whilst Gilhus (2006, 32) argues that these spaces can be regarded as the end product of a long process of gaining control over the wild and its associated 'beasts', I would further add that this was used as a dramatic display of imperial power in Britain; one at which animals and the use and perception of the cultural landscape were at its heart. In the Roman period, hunting took place in constructed landscapes, liminal spaces, where civilisation and wilderness overlapped, where imperial ideology and religious attitudes towards the natural world could be played out. These were spaces where the normal structures of daily life could be dissolved and remade.

The very concept of owning part of an environment is specific to different cultures. In western society the notion that a piece of land cannot be owned is unfamiliar. By contrast, in most non-western cultures people tend to view land as part of themselves, their communities, and involve a kinship with other animals, plants and the spirits which inhabit their realm (Ingold 2000, 150). Here the notion that land can be 'owned', in the western sense, is equally alien. These two concepts have clashed in human history, most notably where colonialism has taken place (*cf.* Banner 1999). New settlers tend to propose and exercise legal rights, derived from their native society, over land in new areas fundamentally providing themselves with access to land at the expense of indigenous populations. The terms 'indigenous' and 'settler' are in themselves ambiguous, masking a range of social relationships which may exist within and between each group. 'Indigenous', for example, suggests that these people were the first to colonise a particular area when, in reality, this may not have been the case. Even settler groups can, very quickly, develop deep and lasting attachments with land (*cf.* Nash 2002). Such associations might be generated through everyday dwelling, by identifying ancestry, or the transmission of cultural memory (Ingold 2000, 132-139). Traditional societies will contrast distant realms with whatever qualities have come to symbolise their heartlands (see Helms 1993, 46).

The beast hunt was important for Roman self-perception (Welch 1994). Of course, perceptions of nature and animals will not remain inert as culture itself alters. When a social group forms or is redistributed, some members will look for ways to define it, aiming to construct, delineate and fix boundaries (Latour 2005, 33). These boundaries and differences, over time, deconstruct or blur, and the social relations between the group and those 'outside' homogenise. This provides further context to the distinction of the human groups who inhabited Fishbourne and the specific engagements they made with animals and the local environment. I believe that the attitudes of people towards nature and religion are of prime importance to the ways they engage with animals. We must also consider the impact of the written word and imperial ideology, but most importantly it is the physical and psychological attachments to land which groups and individuals make that helps create cultural landscapes. Fishbourne was and is a unique site in Britain, but was one of many from where society articulated and creolised traditional Iron Age customs with new imperial ideologies in the creation of the landscape of *Britannia.*

8.4 The Contribution of this Work

Hill (1995, 123-125) argued that the deposition of animals and associated artefacts creates history. This much I think is true, but it also makes landscape; in fact the two probably cannot be extricated. Animal bones in buried contexts are simply how archaeologists come into contact with animals from the past. This is not how people in the past connected with them: burial was a final, short-lived episode ending a course of connected practice. Therefore all interaction with animals has the potential to create and maintain cultural landscapes. People and animals travelled through the landscape, they were inscribed on the landscape, and they were buried within it. As such, animals are both media and agents of cultural landscapes.

On a final note I wish to reflect for a moment on whether my methodology has satisfied my aim. It seems plainly obvious to anyone alive that animals are part of the landscape. Their movements, colours, sounds, smells, tastes and textures illuminate our daily lives in one way or another. I have come to the conclusion that it is this obviousness which turns many archaeologists away from studying this phenomenon. Why look at faunal remains in terms of 'an animal in the landscape' when such a concept is already a given? The answer, I suggest, lies in Thomas' (1996) reflexive approach to the archaeological record. I think economic paradigms simply provide us with a 'virtual reality' perspective of the past, one where the natural world is objectified, and humans are positioned outside the scheme of analysis. I am certainly not saying that examination of past economies is wrong; I think they are imperative, as I have included such analysis here in my own work. I believe, however, that palaeoeconomies should not be seen in isolation; as indeed that zooarchaeological data should not be seen in isolation or examined in a single interpretive manner. I hope to have shown in this thesis that the same data can be approached in different ways, and interpreted against a variety of archaeological, historical and anthropological contexts. This is not a new insight by any means within archaeology, but I suggest that by engaging with the sensory aspects of human-animal relationships we can achieve greater resolution into the landscapes of past societies. As a cultural construct, landscapes are different in the past to what they are today. They are different from one place to another. And even the same places can hold different landscapes for different people. I have approached the evidence from a number of scales and from different angles, and I hope that this thesis has gone some way to developing a model which forwards our discipline. Animalscapes research can be used by zooarchaeologists working on any time period, anywhere in the world, in order to illuminate important insights which human-animal-landscape relationships can tell us about past societies, those which traditional economic approaches alone are unable to reach.

References

Abbink J. 2003, 'Love and death of cattle: The paradox in Suri attitudes toward livestock', *Ethnos* **68.3**, 341-364.

Adams P.C., Hoelscher S.D. and Till K.E. 2000 (eds.), *Textures of Place: Exploring Humanist Geographies* (University of Minnesota Press).

Ainsley C. 2002, 'The animal bones' in Drummond-Murray J., Thompson P. and Cowan C. (eds.), *Settlement in Roman Southwark, Archaeological Investigations (1991-8) for the London Underground Limited Jubilee Line Extension Project*, Museum of London Archaeology Service Monograph **12** (London, Museum of London Archaeology Service) pp.259-74.

Aksakov S.T. and Windle K. 1998, *Notes of a Provincial Wildfowler* (Evanston, Northwestern University Press).

Albarella U. 1997a, The Iron Age animal bones excavated in 1991 from Outgang Road – Market Deeping (MAD 91), Lincolnshire. English Heritage, Ancient Monuments Laboratory Report 5/97.

Albarella U. 1997b. The Iron Age and Roman animal bones excavated in 1996 from Norman Cross, Tort Hill East, Tort Hill West and Vinegar Hill, Cambridgeshire. English Heritage, Ancient Monuments Laboratory Report 108/97.

Albarella U. 2003, 'Animal bone' in Germany M. (ed.), *Excavations at Great Holts Farm, Boreham, Essex, 1992-1994.* East Anglian Archaeology **105** (Essex County Council) pp.193-200.

Albarella U. 2005, 'Alternate fortunes? The role of domestic ducks and geese from Roman to medieval times in Britain', in Grupe G. and Peters J. (eds.), *Documenta Archaeobiologiae III, Feathers, Grit and Symbolism* (Munchen, Verlag M. Leidorf, Rahden/Westf.) pp.249-58.

Albarella U. 2007, 'The end of the sheep age: people and animals in the late Iron Age' in Haselgrove C. and Moore T. (eds.), *The Later Iron Age in Britain and Beyond* (Oxford, Oxbow) pp.389-403.

Albarella U. and Davis S.J.M. 1994, Medieval and post-medieval mammal and bird remains from Launeston Castle, Cornwall: 1961-1982 excavations. English Heritage, Ancient Monuments Laboratory Report 18/94.

Albarella U. and Mulville J. 2001, 'Animal bone' in Lane T. and Morrins E.L. (eds.), *A Millennium of Salt-making: Prehistoric and Romano-British Salt Production in the Fenland.* Lincolnshire Archaeology and Heritage Report Series **4** (Sleaford, Heritage Trust of Lincolnshire) pp.383-388.

Albarella U. and Payne S. 2005, 'Neolithic pigs from Durrington Walls, Wiltshire, England: a biometrical database', *Journal of Archaeological Science* **32.4**, 589-599.

Albarella U., Manconi F., Vigne J.-D. and Rowley-Conwy P. 2007, 'The ethnoarchaeology of traditional pig husbandry in Sardinia and Corsica' in Albarella U., Dobney K., Ervynck A. and Rowley-Conwy P. (eds), *Pigs and Humans: 10,000 Years of Interaction* (Oxford, Oxford University Press) pp.285-307.

Albarella U., Johnstone C. and Vickers K. 2008, 'The development of animal husbandry from the Late Iron Age to the end of the Roman period: a case study from South-East Britain', *Journal of Archaeological Science* **35**, 1828-48.

Alcock S.E. 1997, 'Greece: A landscape of resistance' in Mattingly D. (ed.), *Dialogues in Roman Imperialism: Power, Discourse and Discrepant Experiences in the Roman Empire*, Journal of Roman Archaeology Supplementary series **23** (Portsmouth, Rhode Island) pp.103-116.

Allen M.G. 2006, 'The animal bones from Yarford villa, Somerset', Unpublished report to the Southern Quantocks Archaeological Survey, University of Winchester.

Allen M.G. 2009, 'The re-identification of great bustard (*Otis tarda*) as common crane (*Grus grus*) from Fishbourne Roman Palace', *Environmental Archaeology* **14.2**, 184-190.

Allen M.G. 2010, 'Assessment of the animal bone from Selhurst Park, Eartham, West Sussex', Unpublished report to Chichester District Council.

Allen M.G. in prep, 'a methodology to determine age in sheep *Ovis aries* from dental development using x-radiography and its application to archaeological material', English Heritage Research Report.

Allen M. and Sykes N.J. forthcoming, 'New animals, new landscapes and new worldviews: the Iron Age to Roman transition at Fishbourne', *Sussex Archaeological Collections*.

Allison S. 1997, 'Birds' in Hostetter E. and Howe T.N. (eds.), *The Romano-British Villa at Castle Copse, Great Bedwyn* (Indianopolis, Indiana University Press) pp.330-334.

Anderson K. 1985, *Hunting in the Ancient World* (Berkeley, University of California Press).

Armitage P. 2000a, Fish from Long Lane, LGK99. Unpublished report for PreConstruct Archaeology.

Armitage P. 2000b, Fish from Southwark Cathedral, MTA99. Unpublished report for PreConstruct Archaeology.

Armitage P. 2002a, Fish from the New Wolfson Wing BHB00. Unpublished report for Preconstruct Archaeology.

Armitage P. 2002b, Fish from Swan Street SWN98. Unpublished report for PreConstruct Archaeology.

Armitage P. 2005a, Fish from the Babe Ruth site HGA02. Unpublished report for PreConstruct Archaeology.

Armitage P. 2005b, Fish from Tobacco Dock TOC02. Unpublished report for PreConstruct Archaeology.

Armitage P. and Chapman H. 1979, 'Roman mules', *London Archaeology* **3**, 339-46.

Armitage P., Rudling D. and Parfitt S. 1995, 'The bones' in Aldsworth F. and Rudling D. (eds.), 'Excavations at Bignor Roman villa, West Sussex, 1985-90', *Sussex Archaeological Collections* **133**, 103-88.

Armour-Chelu M. 1991, 'The faunal remains' in Sharples N.M. (ed.), *Maiden Castle: Excavations and Field Survey 1985-6* (London, English Heritage) pp.139-50.

Asch M. 1989, 'Wildlife: defining the animals, the Dene Hunt and the settlement of Aboriginal rights claims', *Canadian Public Policy* **15.2**, 205-219.

Ashdown R. 1981, 'Part II. Avian bones', in Partridge C., *Skeleton Green: A Late Iron Age and Romano-British Site.* Britannia Monograph Series **2** (London, Society for the Promotion of Roman Studies), pp.235-240.

Ashdown R. and Evans C. 1981, 'Part I. Mammalian bones', in Partridge C., *Skeleton Green: A Late Iron Age and Romano-British Site.* Britannia Monograph Series **2** (London, Society for the Promotion of Roman Studies), pp.215-235.

Ayres K. and Clark K. 2000, 'Animal bones', pp.49-53, in Mudd A. and Booth P. (eds.), 'Site of former Hockley Chemical Works, Stratford Road, Alcester: excavations 1994', *Transactions of the Birmingham and Warwickshire Archaeological Society* **104**, 1-74.

Bachelard G. 1968, *The Psychoanalysis of Fire* (Boston, Beacon Press).

Baker, P., 1998. The vertebrate remains from Scole-Dickleburgh, excavated in 1993 (Norfolk and Suffolk), A140 and A143 Road Improvement Project. Ancient Monuments Laboratory Report Series, 29/98. English Heritage, London.

Baker P., Corke E., Davis S., Hammon A. and Revill M. 2006, 'The English Heritage Research Department Vertebrate Skeleton Reference Collection Held at Fort Cumberland, Portsmouth'.
http://www.english-heritage.org.uk/upload/pdf/Vertebrate_skeleton_reference_collection.pdf - last accessed 5th July 2008.

Barker G. 1992, 'Animals as wealth in the African Iron Age: the origins of status?' *Anthropozoologica* **16**, 47-52.

Barber G. 1995, 'Animal bone', pp.179-181 in Broomhead R.A. (ed.), 'Ilchester, Great Yard archaeological excavations 1995', *Proceedings of the Somerset Archaeological and Natural Hisory Society* **142**, 139-191.

Barrett J.C. 1994, *Fragments from Antiquity* (Oxford, Blackwell).

Barrett J.C. 1997a, 'Defining domestic space in the Bronze Age of southern Britain' in Parker Pearson M. and Richards C. (eds.), *Architecture and Order: Approaches to Social Space* (London, Routledge) pp.87-97.

Barrett J.C. 1997b, 'Romanisation: a critical comment', in Mattingly D. (ed.), *Dialogues in Roman Imperialism: Power, Discourse and Discrepant Experiences in the Roman Empire*, Journal of Roman Archaeology Supplementary series **23** (Portsmouth, Rhode Island) pp.51-64.

Barrett J.C. 1999, 'The mythological landscapes of the British Iron Age', in Ashmore W. and Knapp A.B. (eds.), *Archaeologies of Landscape: Contemporary Perspectives* (Oxford, Blackwell Publishers Ltd.) pp.253-268.

Barrett J.C., Bradley R. and Green M. 1991, *Landscape, Monuments and Society: The Prehistory of Cranbourne Chase* (Cambridge, Cambridge University Press).

Bateman N.C.W. 1997, 'The London Amphitheatre: excavations 1987-1996', *Britannia* **28**, 51-85.

Bateman N.C.W. and Locker A. 1982, 'The sauce of the Thames', *The London Archaeologist* **4.8**, 204-207.

Baxter I. 2002, 'A donkey (*Equus asinus* L.) partial skeleton from a mid-late Anglo-Saxon alluvial layer at Deans Yard Westminster, London SW1' *Environmental Archaeology* **7**, 89-94.

Baxter I. 2003, 'Animal bone' in Hinman M. (ed.), *A Late Iron Age Farmstead and Romano-British Site at Haddon, Peterborough.* BAR Report, British Series **358** (Oxford, British Archaeological Report) pp.99-103.

Beagon M. 1992, *Roman Nature: The Thought of Pliny the Elder* (Oxford, Clarendon Press).

Beagon, M. 1996, 'Nature and views of her landscapes in Pliny the Elder' in Shipley G. and Salmon J. (eds.), *Human Landscapes in Classical Antiquity: Environment and Culture* (London, Routledge) pp.284-329.

Beagon M. 2005 *The Elder Pliny on the Human Animal. Natural History Book 7* (Oxford, Oxford University Press).

Beck L. 2005, 'Secondary burial practices in Hohokam cremations' in Rakita G., Buikstra J., Beck L. and Williams S. (eds.) *Interacting with the Dead: Perspectives on Mortuary Archaeology for the New Millennium* (Gainsville, University Press of Florida) pp.150-54.

Bedwin O. 1978, 'Animal bones', p.253 in Bedwin O. (ed.), 'The excavation of a Romano-British site at Ranscombe Hill, South Malling, East Sussex, 1976', *Sussex Archaeological Collections* **116**, 241-255.

Bedwin O. 1980, 'Excavations at Chanctonbury Ring, Wiston, West Sussex 1977', *Britannia* **11**, 173- 222.

Bedwin O. 1995, 'Animal bones', p. 95 in Bedwin O. and Place C. (eds.), 'Late Iron Age and Romano-British occupation at Ounces Barn, Boxgrove, West Sussex; excavations 1982-82', *Sussex Archaeological Collections* **133**, 45-101.

Bedwin O. and Holgate R. 1985 (eds.), 'Excavations at Copse Farm, Oving, West Sussex', *Proceedings of the Prehistoric Society* **51**, 215-246.

Bedwin O. and Place C. 1995 (eds.), 'Late Iron Age and Romano-British occupation at Ounces Barn, Boxgrove, West Sussex; excavations 1982-82', *Sussex Archaeological Collections* **133**, 45-101.

Beech M. 1986, 'The animal bones', pp.45-47 in Holgate R. (ed.), 'Excavations at the late prehistoric and Romano-British enclosure complex at Carne's Seat, Goodwood, West Sussex, 1984', *Sussex Archaeological Collections* **124**, 35-50.

Beech M. 2006, 'Animal remains: evidence of animal sacrifice' in Evans C. and Hodder I. (eds.), *Marshland Communities and Cultural Landscapes from the Bronze Age to Present Day*. The Haddenham Project Volume 2 (Cambridge, McDonald Institute for Archaeological Research) pp.369-396; 435-440.

Bell M. 1995, 'People and nature in the Celtic World' in Green M.J. (ed.), *The Celtic World* (London, Routledge) pp.145-155.

Bendrey R. 1999, 'Faunal remains', pp.137-141 in Houliston M. (ed.), 'Excavations at the Mount Roman villa, Maidstone, 1994', *Archaeologia Cantiana* **119**, 71-172.

Bendrey R. 2002a, 'The animal bones from excavations at Four Elms Roundabout, Wainscott', Unpublished report to the Canterbury Archaeological Trust.

Bendrey R. 2002b, 'The animal bones from excavations at the Channel Tunnel Terminal at Cheriton, Folkestone', Unpublished report to the Canterbury Archaeological Trust.

Bendrey R. 2003, 'The identification of fallow deer (*Dama dama*) remains from Roman Monkton, the Isle of Thanet, Kent' in Riddler I.D. (ed.), *Materials of Manufacture. The Choice of Materials in the Working of Bone and Antler in Northern and Central Europe during the First Millennium AD.* BAR International Series **1193** (Oxford, Archaeopress) pp.15-18

Bendrey R. 2006, 'The animal bones from excavations at Myncen Farm, Minchington, Sixpenny Handley, Dorset', Unpublished report to the Dorset Natural History and Archaeological Society.

Bendrey R. 2007, 'New methods for the identification of evidence for bitting on horse remains from archaeological sites', *Journal of Archaeological Science*, **34**, 1036-1050.

Bendrey R. 2010, 'The Horse' in O'Connor T. and Sykes N.J. (eds.), *Extinctions and Invasions: A Social History of British Fauna* (Oxford, Windgather).

Bendrey R., Hayes T.E. and Palmer M. 2009, 'Patterns of Iron Age horse supply: an analysis of strontium isotope ratios in teeth', *Archaeometry*, **51.1**, 140–150.

Benecke, N. 1989. Die Tierknochenfunde aus einer germanischen Siedlung bei Penzlin, Kreis Waren. Bodendenkmalpflege in Mecklenburg Jahrbuch 1988, pp. 175-191.

Berg D.S. 1999, 'The mammal bones' in Abramson P., Berg D.S. and Fossick M.R. (eds.), *Roman Castleford: Excavations 1974-85, vol.II The Structural and Environmental Evidence*; Yorkshire Archaeology 5 (Wakefield, West Yorkshire Archaeology Service) pp.223-281.

Berger J. 2007, 'Why look at animals?' in Kalof L. and Fitzgerald A. (eds.), *The Animal Reader: the Essential Classic and Contemporary Writings* (London, Berg) pp.251-261

Bergmann B. 1994, 'Painted perspectives of a villa visit: landscape as status and metaphor' in Gadza E.K. (ed.), *Roman Art in the Private Sphere: New Perspectives on the Architecture and Décor of the Domus, Villa and Insula* (Ann Arbor, University of Michigan Press) pp.49-69.

Bevan B. 1997, 'Bounding the landscape: place and identity during the Yorkshire Wolds Iron Age' in Gwilt A. and Haselgrove C. (eds.) *Reconstructing Iron Age Societies* (Oxford, Oxbow monographs 71) pp.181-191.

Biek L. and Cripps E.S. 1963, 'Distribution of animal remains', pp.258-260 in Greenfield E. 1963, 'The Romano-British shrines at Brigstock, Northants', *Antiquaries Journal* **43**, 228-63.

Binford L.R. 1978, 'Dimensional analysis of behaviour and site structure: learning from an Eskimo hunting stand', *American Antiquity* **43.3**, 330-361.

Binford L.R. 1981, *Bones: Ancient Men and Modern Myths* (New York, Academic Press).

Binford L.R. 1983, *In Pursuit of the Past* (London, Thames and Hudson).

Bird-David, N. 1992, 'Beyond 'the original affluent society': a culturalist reformulation', *Current Anthropology* **33**, 25–47.

Birley A. 2005, *The Roman Government of Britain* (Oxford, Oxbow).

Blench R. 2004, *You Can't go Home Again: Pastoralism in the New Millennium* (London, Overseas Development Institute).

Blunt A. and McEwan C. 2002, 'Introducing postcolonial geographies,' in A. Blunt and C. McEwan (eds.) *Postcolonial Geographies* (Continuum, London) pp. 1-6.

Bomgardner D.L. 1992, 'The trade in wild beasts for Roman spectacles: a green perspective', *Anthropozoologica* **16**, 161-166.

Bouissou M. F., Boissy A., Le Neindre P., and Veissier. I. 2001, 'The social behaviour of cattle' in Keeling L. and Gonyou H. (eds.) *Social Behaviour in Farm Animals* (Wallingford, CABI) pp.113–145.

Bourdieu P. 1977, *Outline of a Theory of Practice.* Trans. R. Nice (Cambridge, Cambridge University Press).

Bowman A.K. and Thomas D. 1994, *The Vindolanda Writing Tablets* (London, British Museum Press).

Boyle A.J. 1986, *The Chaonian Dove: Studies in the Eclogues, Georgics, and Aeneid of Virgil* (Leiden, E.J.Brill).

Bradley R. 1969, 'The Chichester dykes – a dissenting judgement', *Sussex Archaeological Collections* **107**, 137-140.

Bradley R. 1971, 'A field survey of the Chichester entrenchments' in Cunliffe B.W. *Excavations at Fishbourne*, Volume One (London, Society of Antiquaries of London) pp.17-36.

Bradley R. 1990, *The Passage of Arms: An Archaeological Analysis of Prehistoric Hoard and Votive Deposits* (Cambridge, Cambridge University Press).

Bradley R. 2000, *An Archaeology of Natural Places* (London, Routledge).

Bradley R. 2005 'Domestication, sedentism, property and time: materiality and the beginnings of agriculture in Northern Europe' in: DeMarrais E., Gosden C. and Renfrew C. (eds.), *Rethinking Materiality: the Engagement of Mind with the Material World* (Cambridge, McDonald Institute for Archaeological Research) pp. 107-115.

Bradley R., Entwhistle R. and Raymond F. 1994, *Prehistory and Land Divisions on Salisbury Plain* (London, English Heritage).

Bramwell D. 1980, 'Bird bones', pp.89-90 in Hinchliffe J. and Thomas R. (eds.), 'Archaeological excavations at Appleford', *Oxoniensia* **XLV**, 9-111.

Bramwell D. 2000, 'Bird bones' in Price E. (ed.) *Frocester: A Romano-British Settlement, its Antecedents and Successors, vol.II: Finds* (Stonehouse, Gloucestershire and District Archaeological Research Group) pp.217-44.

Bramwell D. 2006, 'Birds', pp.220-221 in Barfield L. (ed), 'Bays Meadow Villa, Droitwich: excavations 1967-77', in Hurst D. (ed.), *Roman Droitwich: Dodderhill Fort, Bays Meadow Villa, and Roadside Settlement*, CBA Research Report **146** (York, Council for British Archaeology) pp.78-242.

Branigan K. 1980, *Roman Britain: Life in an Imperial Province* (London, Readers Digest).

Branigan K. and Miles D. (eds.) 1988, *Villa Economies: Economic Aspects of Romano-British Villas* (Sheffield, University of Sheffield).

Branigan K., Dearne M.J. and Rutter J.G. 1993, 'Romano-British occupation of Minchin Hole Cave, Gower', *Archaeologia Cambrensis* **142**, 40-73.

Brewster T.C.M. 1980, *The Excavation of Garton and Wetwang Slacks* (The East Riding Archaeological Research Committee).

Briggs D., Haselgrove C. and King C.1992 'Iron Age and Roman coins from Hayling Island temple', *British Numismatic Journal* **62**, 1-62.

Bronk Ramsey C. 2000 'Radiocarbon dates from the Oxford AMS system', *Archaeometry* **42.2**, 459–79.

Brown W.A.B. and Chapman N.G. 1991a, 'The dentition of fallow deer (*Dama dama*): a scoring scheme to assess age from wear of the permanent molariform teeth', *Journal of Zoology (London)* **225**, 85-97.

Brown W.A.B. and Chapman N.G. 1991b, 'The dentition of red deer (*Cervus elaphus*): a scoring scheme to assess age from wear of the permanent molariform teeth', *Journal of Zoology (London)* **224**, 519-536.

Browne S. 1985, 'The bone', p.234/microfiche 46-72 in Bedwin O. and Holgate R. (eds.), 'Excavations at Copse Farm, Oving, West Sussex', *Proceedings of the Prehistoric Society* **51**, 215-246.

Buckland-Wright J.C. 1987, 'The animal bones' in Sparey-Green C. (ed.), *Excavations at Poundbury, Dorchester, Dorset 1966-82, vol.I: The Settlements* (Dorchester, Dorset Natural History and Archaeology Society) microfiche 4-6.

Buckland-Wright J.C. 1990, 'The animal bones' in Aitken G.M. and Aitken G.N. (eds.), 'Excavations at Whitcombe, 1965-7', *Dorset Natural History and Archaeology Society Proceedings* **112**, 57-94.

Budd P. and Taylor T. 1995, 'The Faerie smith meets the bronze industry: magic versus science in the interpretation of pre-historic metal-making', *World Archaeology* **27**, 133-143.

Bullock A. and Allen M.J. 1997, 'The animal bones' in Smith R.J.C., Healy F., Allen M.J., Morris E.L., Barnes I. and Woodward P.J. (eds.), *Excavations Along the Route of the Dorchester By-pass, Dorset, 1986-8.* Wessex Archaeology Report No.11 (Salisbury, Trust for Wessex Archaeology) pp.190-199.

Bunting G.H., Verity D.W.and Cornwall I.W. 1963, *Bury Wood Camp, Report on Excavations, 1960* (Worcestershire Archaeological Monograph).

Burton J.W. 1981 'Ethnicity on the hoof: on the economics of nuer identity', *Ethnology* **20.2**, 157-162.

Bushe-Fox J.P. 1949, *Fourth Report on the Excavations of the Roman Fort at Richborough, Kent*, Report of the Research Committee of the Society of Antiquaries of London, no. **16**. (London, Society of Anitquaries).

Bussatta S. 2007 'Good to think: animals and power', *Antrocom* **4.1**, 3-11.

Byerly R.M, Cooper J.R., Meltzer D.J., Hill M.E. and LaBelle J.M. 2005, 'On bonfire shelter (Texas) as a Paleoindian bison jump: an assessment using GIS and zooarchaeology', *American Antiquity* **70.4**, 595-629.

Carandini A. 1982, *Filosofiana: The Villa at Piazza Armerina* (Palermo).

Carey S. 2003, *Pliny's Catalogue of Culture* (Oxford, Oxford University Press).

Carnutt J. 2001, *Animals and the Law: A Source Book* (Santa Barbara, ABC-Clio).

Carr G. and Knüsel C. 1997, 'The ritual framework of excarnation by exposure as the mortuary practice of the Early and Middle Iron Ages of central southern Britain', in Gwilt A. and Haselgrove C. (eds.) *Reconstructing Iron Age Societies, New Approaches to the British Iron Age,* Oxbow Monograph **71** (Oxford, Oxbow), pp. 167-173.

Carter R.J. 1997, 'Age estimation of the roe deer *Capreolus capreolus* mandibles from the Mesolithic site of Star Carr, Yorkshire, based on radiographs of mandibular tooth development', *Journal of Zoology (London)* **241**, 495-502.

Carter R.J. 1998, 'Reassessment of seasonality at the early Mesolithic site of Star Carr, Yorkshire, based on radiographs of mandibular tooth development in red deer *Cervus elaphus*', *Journal of Archaeological Science* **25**, 851-856.

Carter R.J. 2001a, 'New evidence for seasonal human presence at the early Mesolithic site of Thatcham, Berkshire, England', *Journal of Archaeological Science* **28**, 1055-1060.

Carter R.J. 2001b, 'Dental indicators of seasonal human presence at the Danish boreal sites of Holmegaard I, IV, V and Mullerup and the Atlantic sites of Tybrind Vig and Ringkloster', *The Holocene* **11.3**, 359-365.

Carter R. 2006, 'A method to estimate the ages at death of red deer (*Cervus elaphus*) and roe deer (*Capreolus capreolus*) from developing mandibular dentition and its application to Mesolithic NW Europe' in Ruscillo D. (ed.), *Recent Advances in Ageing and Sexing Animal Bones*; 9th ICAZ Conference, Durham (Oxbow, Oxford) pp.40-61.

Carter R.J. and Magnell, O. 2007, 'A new method of age estimation in wild boar (*Sus scrofa*) based on molariform mandibular tooth development and its application to Mesolithic NW Europe' in Albarella U., Dobney K., Ervynck A. and Rowley- Conwy P. (eds.), *Pigs and Humans: 10,000 years of Interaction* (Oxford University Press, Oxford) pp.197-217.

Carter P.L., Phillipson D. and Higgs E.S. 1965, 'Faunal report', pp.40-42 in Hastings F.A., 'Excavations of an Iron Age farmstead at Hawks Hill, Leatherhead', *Surrey Archaeological Collections* **62**, 1–43.

Cartmill M. 1993, *A View to a Death in the Morning: Hunting and Nature through History* (Cambridge, Harvard University Press).

Cartmill M. 1995 'Hunting and humanity in Western thought', *Social Research* **62**, 773-786.

Chaplin R.E. and Barnetson L.P. 1980, 'Animal bones', in Stead I., *Rudston Roman Villa* (Yorkshire Archaeological Society) pp. 149-161.

Chaplin R.E. and McCormick F. 1986, 'The animal bones', in Stead I.M. and Rigby V., *Baldock: The Excavation of a Roman and Pre-Roman Settlement 1968–72* (London, Britannia Monograph), pp. 396–415.

Chapman D.I. and Chapman M.G. 1975, *Fallow Deer* (Colchester, Terence Dalton Ltd.)

Charles B. 1999, 'Animal bone', in Cromerty A.M. (ed.), *The Excavation of a Late Iron Age Enclosed Settlement at Bicester Fields Farm*, pp 153-233.

Chenery C., Müldner G., Evans J., Eckardt H., Leach S. and Lewis M. 2010, 'Strontium and stable isotope evidence for diet and mobility in Roman Gloucester, UK', *Journal of Archaeological Science* **37**, 150-163.

Cheniér A. 2009, 'Bones, people and communities: tensions between individual and corporate identities in secondary burial ritual', *Nexus: The Canadian Student Journal of Anthropology* **21**, 27-40.

Childe V.G. 1933 'Is prehistory practical?', *Antiquity* **7**, 410-18.

Childe V.G. 1940, *Prehistoric Communities of the British Isles* (London, Chambers).

Church M.J., Arge S.V., Brewington S., McGovern T.H., Woolett J.H., Perdikaris S., Lawson I.T., Cook G.T., Amundsen C., Harrison R., Krivogorskaya K., and Dunbar E. 2005, 'Puffins, pigs, cod and barley: palaeoeconomy at Undir Junkarinsflotti, Sandoy, Faroe.' *Environmental Archaeology* **10**, 17-97.

Clutton-Brock J. 1982, 'Appendix 1: The animal bone, microfiche 44-54' in Perry B. T. 'Excavations at Bramdean, Hampshire, 1973 to 1977', *Proceedings of the Hampshire Field Club and Archaeological Society* **38**, 57-74.

Clutton-Brock J. 1992, *Horse Power: A History of the Horse and the Donkey in Human Societies* (Harvard University Press).

Clutton-Brock J. 1994 'The unnatural world: behavourial aspects of humans and animals in the process of domestication' in Manning A. and Serpell J.A. (eds.) *Animals and Human Society: Changing Perspectives* (London, Unwin Hyman) pp. 23-35.

Clutton-Brock J. 1999, *A Natural History of Domesticated Mammals* (Cambridge, University Press).

Clutton-Brock J. and Burleigh R. 1991, 'The skull of a Neolithic horse from Grimes Graves, Norfolk, England', in Meadows R.H. and Uerpmann H.P. (eds.), *Equids in the Ancient World,* Volume II (Weisbaden), pp. 242-249.

Coates P. 1998, *Nature: Western Attitude since Ancient Times* (Cambridge, Polity Press).

Cohen A. and Serjeantson D. 1996, *A Manual for the Identification of Bird Bones from Archaeological Sites: Revised Edition* (London, Archetype Publications).

Collias N.E. and Collias E.C. 1996, 'Social organisation of red jungle fowl, *Gallus gallus*, population related to evolution theory', *Animal Behaviour* **51**, 1337-1354.

Colin J.A. 2008, 'Roman seal boxes', http://www.ukdfd.co.uk/pages/roman-seal-boxes.html - last accessed November 2009.

Collis J. 1984, *Oppida: Earliest Towns North of the Alps* (Sheffield, University of Sheffield).

Collis J. 2003, *The Celts: Origins, Myths and Inventions* (Stroud, Tempus).

Connell B. and Davis S. 1998, The animal bone from the Lanes excavations, Carlisle. Unpublished report from Wessex Archaeology.

Cool H.E.M. 2006, *Eating and Drinking in Roman Britain* (Cambridge, Cambridge University Press).

Cooley A.E. 2002, *Becoming Roman, Writing Latin? Literacy and Epigraphy in the Roman West* (Portsmouth, Society of Roman Studies).

Copley M.S. 2005 'Processing of milk products in pottery vessels through British prehistory' *Antiquity* **79.306**, 895-908.

Corbin J.R. and Corbin M.D. 1987, *Urbane Thought: Culture and Class in an Andalusian City* (Aldershot, Gower Publishing Company Ltd.)

Cornwall I. and Meddens B. 2002, 'Animal bone' in Barford P.M. (ed.), *Excavations at Little Oakley, Essex, 1951-78: Roman Villa and Saxon Settlement.* East Anglian Archaeology **98** (Dereham, Norfolk Archaeology Trust) pp.98-104.

Coy J. 1981, 'The animal bones', pp.106-110 in Silvester R.J. (ed.), 'An excavation on the post- Roman site at Bantham, South Devon', *Devon Archaeological Society Proceddings* **39**, 89-118.

Coy J. 1987, 'Animal bones' in Fasham P.J. (ed.), *A Banjo Enclosure in Micheldever Wood, Hampshire.* Hampshire Field Club Monograph **5** (Hampshire Field Club) pp.45-48.

Crabtree P.J. 1989a, 'Faunal remains from Iron Age and Romano-British features' in West S. (ed.), *West Stow, Suffolk: The Prehistoric and Romano-British Occupations.* East Anglian Archaeology Report No.**48** (Bury St Edmunds, Suffolk County Planning Department) pp.101-105.

Crabtree P.J. 1989b, 'Sheep, horses, swine and kine: A zooarchaeological persective on the Anglo-Saxon settlement of England', *Journal of Field Archaeology* **16.2**, 205-13.

Cram C.L. 1973, 'Report on the animal bones', in Broadribb A.C.C. (ed.), *Excavations at Shakenoak IV*, (Oxford, British Archaeological Reports) pp.145-64.

Cram C.L. 1978, 'Animal bones' in Broadribb A., Hands A. and Walker D. (eds.), *Excavations at Shakenoak V* (Oxford, British Archaeological Reports).

Cramp L. 2008, Foodways and Identity: Organic Residue Analysis of Roman Mortaria and other Pottery. Unpublished PhD Thesis. University of Reading.

Creighton J. 2000, *Coins and Power in Late Iron Age Britain* (Cambridge, Cambridge University Press).

Creighton J. 2001, 'The Iron Age – Roman transition' in James S. and Millet M. (eds.), *Britons and Romans: Advancing the Research Agenda*, CBA Research Report **125** (Council for British Archaeology) pp.4-11.

Creighton J. 2005, 'Cattle, community and corrals', *Archaeological Dialogues* **12.2**, 132-135.

Creighton J. 2006, *Britannia: The Creation of a Roman Province* (London, Routledge).

Cripps L.J. 2007, 'Re-situating the later Iron Age in Cornwall and Devon: new perspectives from the settlement record' in Haselgrove C. and Moore T. (eds.), *The Later Iron Age in Britain and Beyond* (Oxford, Oxbow) pp.140-155.

Crummy N. 1983, *Colchester Archaeological Report 2: The Small Finds from Excavations in Colchester 1971-9* (Colchester, Colchester Archaeological Trust).

Cummins J. 1988, *The Hound and the Hawk: the Art of Medieval Hunting* (London: Weidenfeld and Nicolson).

Cunliffe B. 1971, *Excavations at Fishbourne 1961-1969*, Report to the Research Committee of the Society of Antiquaries of London No.**28** (London, Society of Antiquaries).

Cunliffe B. 1973, *The Regni* (London, Duckworth).

Cunliffe B. (ed.) 1977, *Excavations at Portchester Castle 1: Roman.* Report of the Research Committee of the Society of Antiquaries of London No.**32** (London, Society of Anitiquities of London).

Cunliffe B. 1981 'Roman gardens in Britain: a review of the evidence', in MacDougall E.B. and Jashemski W.F. (eds.) *Ancient Gardens* (Dumbarton Oaks, Washington) pp. 95-108.

Cunliffe B. 1988 *Greeks, Romans and Barbarians: Spheres of Interaction* (London, Batsford).

Cunliffe B. 1991, *Iron Age Communities in Britain: An Account of England, Scotland and Wales from the Seventh Century BC to the Roman Conquest.* (Oxford, Routledge).

Cunliffe B. 1994, 'After hillforts', *Oxford Journal of Archaeology* **13.1**, 71-84.

Cunliffe B. 1998, *Fishbourne Roman palace* (London, History Press Ltd).

Cunliffe B. 2000 'Landscapes with people', in Flint K. and Morphy H. *Culture, Landscape and the Environment: The Linacre Lectures* (Oxford, Oxford University Press) pp.111-130.

Cunliffe B. 2003, 'Fishbourne revisited', *Sussex Archaeological Collections* **141**, 1-5.

Cunliffe B. and Poole C., 1991, *Danebury: An Iron Age Hillfort in Hampshire.* Volumes 4 and 5 (London, Council for British Archaeology).

Cunliffe B. and Poole C., 2008 *The Danebury Environs Roman Programme. A Wessex Landscape during the Roman Era.* Vol. 2: The Sites (London, Council for British Archaeology).

Cunliffe B., Down A. and Rudkin D. 1996, *Excavations at Fishbourne 1969-1988.* Chichester Excavations **IX** (Chichester, Chichester District Council).

Curl J. 2005, 'Faunal remains' pp.692-3, in Birks C. and Robertson D. (eds.), 'Prehistoric settlement at Stanford: excavations at Lynford Quarry, Norfolk 2000-2001', *Norfolk Archaeology* **44.4**, 676-695.

Dahl G. and Hort A. 1976, *Having Herds. Pastoral Herd Growth and Household Economy.* Stockholm Studies in Social Anthropology (Stockholm, University of Stockholm).

Dannell G. 1971 'Samian ware' in Cunliffe B. (ed.), *Excavations at Fishbourne 1961-1969*, Report to the Research Committee of the Society of Antiquaries of London No.**28** (Leeds, Society of Antiquaries) pp. 260-316.

Dark P. 2000, *The Environment of Britain in the First Millennium A.D.* (London, Duckworth).

D'Arms J. 1970, *Romans on the Bay of Naples* (Harvard University Press).

Davenport C. 2003, 'The Late Pre-Roman Iron Age of the West Sussex Coastal Plain: continuity or change?' in Rudling D. (ed.), *The Archaeology of Sussex to AD2000* (The University of Sussex) pp.101-110.

Davies R.W. 1971, 'The Roman military diet', *Britannia* **2**, 122-142.

Davis S.J.M. 1987, *The Archaeology of Animals* (London, B.T. Batsford Ltd.).

Davis S.J.M. 1995, Animal bones from the Iron Age site at Edix Hill, Barrington, Cambridgeshire, 1989-91 excavations. English Heritage: Ancient Monuments Laboratory Report 54/95.

Davis S.J.M., 1997, Animal bones from the Roman site Redlands Farm, Stanwick, Northamptonshire, 1990 excavations. English Heritage, Ancient Monument Laboratory Report Series 106/97.

Davis S.J.M. 2006, 'Animal bone', pp.42-45 in McAvoy F. (ed.), 'Dodderhill, Droitwich: excavations 1977-85', in Hurst D. (ed.), *Roman Droitwich: Dodderhill Fort, Bays Meadow Villa, and Roadside Settlement*, CBA Research Report **146** (York, Council for British Archaeology) pp.1-77.

De la Bedoyere G. 2003, *Roman Towns in Britain* (Stroud, Tempus).

De la Bedoyere G. 2006, *Roman Britain: A New History* (London, Thames and Hudson).

Descola P. and Palsson A. (eds.) 1996, *Nature and Society: Anthropological Perspectives* (London, Routledge).

Dietler M. 2005, *The Archaeology of Colonization and the Colonization of Archaeology* (Lattes, France: Monographies d'Archéologie Meditéranéenne).

Dietler M. and B. Hayden 2001, 'Digesting the feast -- good to eat, good to drink, good to think: an introduction', in Dietler M. and Hayden B. (eds.) *Feasts: Archaeological and Ethnographic Perspectives on Food, Politics, and Power* (Washington DC, Smithsonian) pp.1-20.

Dietler M. and Herbich I. 1998, '*Habitus*, techniques, style: An integrated approach to the social understanding of material culture and boundaries' in Stark M.T. (ed.), *The Archaeology of Social Boundaries* (Washington, Smithsonian Institution Press) pp.232-263.

Dincauze D.F. 2000, *Environmental Archaeology: Principles and Practice* (Cambridge, Cambridge University Press).

Dix B. (ed.) 1986-87 'Archaeology in Northamptonshire 1985-6' *Northamptonshire Archaeology* **21**, 153-159.

Dobney K. 2001, 'A place at the table: the role of vertebrate zooarchaeology within a Roman research agenda for Britain' in James S. and Millet M. (eds.), *Britons and Romans: Advancing the Research Agenda*, CBA Research Report **125** (Council for British Archaeology) pp.36-45.

Dobney K. and Ervnyck A. 2007, 'To fish or not to fish? Evidence for the possible avoidance of fish consumption during the Iron Age around the North Sea' in Haselgrove C. and Moore T. (eds.), *The Later Iron Age in Britain and Beyond* (Oxford, Oxbow) pp.403-418.

Dobney K. and Jaques D. 1990, 'Animal bones from the excavations at Birdlip, Glos.', English Heritage, Ancient Monuments Laboratory Report 26/90.

Dobney K. and Jaques D. 1996, 'The mammal bones', in Williams R.J., Hart P.J. and Williams A.T.L., *Wavendon Gate: a Late Iron Age and Roman Settlement in Milton Keynes*, (Aylesbury, Buckinghamshire Archaeology Society Monograph **10**) pp. 203–230.

Dobney K., Jaques S.D. and Irving B.G. 1996, *Of Butchers and Breeds: Report on Vertebrate Remains from Various Sites in the City of Lincoln*. Lincoln Archaeological Studies, no.5 (Lincoln, Lincoln Archaeological Unit).

Dobney K., Jaques D., Carrott J. Hall A., Issitt M. and Large F. 2000, 'Biological remains', pp.148-182 in Ottoway P. (ed.), 'Excavations on the site of the Roman signal station at Carr Naze, Filey, 1993-94', *Archaeological Journal* **157**, 79-199.

Dobney K., Albarella U., Fuller B., Pearson J. and Muldner G. 2002, 'Stable isotope evidence of *Sus* diets from European and Near Eastern archaeological sites' in Albarella U., Dobney K., Huntley J. And Rowley-Conwy P. (eds.), *Abstract of the ICAZ Durham Conference, University of Durham,* (Durham, International Council of Archaeozoology) p.108.

Donald-Hughes J. 1994, *Pan's Travail: Environmental Problems of the Ancient Greeks and Romans* (London, John Hopkins University Press).

Done G. 1986, 'The animal bones from areas A and B' in Millett M. and Graham D. (eds.), *Excavations on the Romano-British Small Town at Neatham, Hampshire, 1969-1979.* Hampshire Field Club Monograph **3** (Hampshire Field Club and Archaeological Society) pp.141-146.

Douglas M. 1966, *Purity and Danger: An Analysis of the Concepts of Pollution and Taboo* (London, Routledge and Kegan Paul).

Down A. 1979, *Chichester Excavations* **IV** (Chichester, Phillimore).

Down A. 1989, *Chichester Excavations* **VI** (Chichester, Phillimore).

Downes J. 1997, 'The shrine at Cadbury Castle: belief enshrined?' in Gwilt A. and Haselgrove C. (eds.) *Reconstructing Iron Age Societies.* Oxbow Monographs **71** (Oxford, Oxbow Books) pp.145-152.

Driessen H. 1981, *Agro Town and Urban Ethos in Andalusia* (Nijemen, Katholieke Universteit).

Driver J.C. 1982 'Medullary bone as an indicator of sex in bird remains from archaeological sites' in Wilson B., Grigson C. and Payne S. (eds.), *Ageing and Sexing Animal Bones from Archaeological Sites,* BAR British Series **109** (Oxford, British Archaeological Report) pp.251-254.

Driver F. and Gilbert D. 1998 'Heart of Empire: landscape, place and performance in imperial London', *Environment and Planning D; Society and Space* **16,** 11-28.

Dundas C. 1913, 'History of Kitui', *Journal of the Royal Anthropological Institute* **43,** 480-549.

Durkheim E. 1976, *The Elementary Forms of the Religious Life* (London, Allen and Unwin Ltd).

Eastham A. 1971, 'The bird bones' in Cunliffe B. (ed.), *Excavations at Fishbourne 1961-1969*, Report to the Research Committee of the Society of Antiquaries of London No.**28** (Leeds, Society of Antiquaries of London) pp.388-393.

Eastham A. 1975, 'The bird bones' in Cunliffe B. (ed.), *Excavations at Portchester Castle 1: Roman.* Report of the Research Committee of the Society of Antiquaries of London No.**32** (London, Society of Antiquities of London) pp.409-418.

Eckardt H., Booth P., Chenery C., Müldner G., Evans J.A. and Lamb A. 2009, 'Isotope evidence for mobility at the late Roman cemetery at Lankhills, Winchester', *Journal of Archaeological Science* **36**, 2816-2825.

Eisenmann V. 1986, 'Comparative osteology of modern and fossil horses, half-asses and asses', in Meadow R. H. and Uerpmann H-P. *Equids in the Ancient World.* (Weisbaden: Dr. Ludwig Reichert Verlag), pp. 67-116.

Ekroth G. 2008, 'Burnt, cooked or raw? Divine and human culinary desires at Greek animal sacrifice', in Stavrianopoulou E., Michaels A. and Ambos C. (eds.) *Transformations in Sacrificial Practices. From Antiquity to the Modern Times. Proceedings of an International Colloquium, Heidelberg, 12-14 July 2006, Heidelberg* (Performances, Intercultural Studies on Ritual, Play and Theatre 15) pp. 87-111.

Enghoff I.B. 2000, 'Fishing in southern North Sea region from 1st to 16th century AD: evidence from fish bones', *Archaeofauna* **9**, 59-132.

Epplett C. 2001, 'The capture of animals by the Roman military', *Greece and Rome* **48.2**, 210-222.

Ervynck A. 2005, 'Detecting the seasonal slaughtering of domestic mammals: inferences from the detailed recording of tooth eruption and wear', *Environmental Archaeology* **10**, 153-169.

Ervynck A. 2007 'An investigation into the transition from forest dwelling pigs to farm animals in medieval Flanders, Belgium' in Albarella U., Dobney K., Ervynck A. and

Rowley-Conwy P. (eds), *Pigs and Humans: 10,000 years of interaction* (Oxford, Oxford University Press) pp. 171-196.

Ervynck A., Van Neer W., Hüster-Plogmann H. and Schibler J. 2003, 'Beyond affluence: the zooarchaeology of luxury', *World Archaeology* **34.3**, 428-441.

Evans C. 1997, 'Hydraulic communities: Iron Age enclosure in the East Anglian fenlands', in Gwilt A.and Haselgrove C. (eds.), *Reconstructing Iron Age Societies: New Approaches to the British Iron Age.* Oxbow Monograph **71** (Oxford, Oxbow Books) pp. 216-227.

Evans C. and Hodder I. 2006, *The Haddenham Project.* McDonald Institute Monographs (Cambridge, McDonald Institute for Archaeological Research).

Evans E. 2007, 'Animal bone' in Miles D., Palmer S., Smith A. and Perpetua Jones P. (eds.), *Iron Age and Roman Settlement in the Upper Thames Valley, Excavations at Claydon Pike and other Sites within the Cotswold Water Park.* Thames Valley Landscapes Monograph **26** (Oxford, Oxford University School of Archaeology) pp.268-269.

Evans J.G. 2003, *Environmental Archaeology and the Social Order* (London, Routledge).

Evans N. and Yarwood R. 1995, 'Livestock and landscape', *Landscape Research* **20.3**, 141-146.

Evans-Pritchard E.E. 1951 *Kinship and Marriage among the Nuer* (Salisbury, Clarendon Press).

Everton R.F. 1981, 'The animal bones', pp.218-225 in Leech R. (ed.), 'The excavation of a Romano-British farmstead and cemetery on Bradley Hill, Somerton, Somerset' *Britannia* **12**, 177-252.

Everton R.F. 1982, 'The animal bone', in Leech R. (ed.), *Excavations at Catsgore 1970-3* (Bristol, Bristol Archaeological Society) pp.141-146.

Farb P. and Armelagos G. 1980, *Consuming Passions: The Anthropology of Eating* (Boston, Houghton Mifflin).

Fifield P.W. 1988, 'The faunal remains', in Potter T.W. and Trow S.D. (eds.), *Puckeridge-Braughing, Hertfordshire: The Ermine Street Excavations 1971-2*. Hertfordshire Archaeology Monograph **10** (Hertford, Hertfordshire Archaeological Trust) pp.148-155

Fitzpatrick A.P. 1984, 'The deposition of La Tenè Iron Age metalwork in watery contexts in southern England' in Cunliffe B. and Miles D. (eds.), *Aspects of the Iron Age in Central Southern Britain* (Oxford, Oxford University Press) pp.178-190.

Fitzpatrick A.P. 1997, 'Everyday life in Iron Age Wessex', in Gwilt A. and Haselgrove C. (eds.), *Reconstructing Iron Age Societies: New Approaches to the British Iron Age*. Oxbow Monograph **71** (Oxford: Oxbow Books) pp.73-86.

Folkard H.C. 2005, *The Wildfowler: A Treatise on Fowling, Ancient and Modern*. Original Publishing in 1859 (Read Books).

Foster J. 1977, *Bronze Boar Figurines in the Iron Age and Roman Britain*. British Archaeological Reports British Series **39** (Oxford, British Archaeological Reports).

Fowler P. J. 1983, *The Farming of Prehistoric Britain* (Cambridge University Press).

Fraser F.C. 1968, 'Animal bones from Hod Hill, I: sites within the Roman fort' in Richmond I. (ed.), *Hod Hill, vol.II: Excavations carried out between 1951 and 1958 for the Trustees of the British Museum* (London, British Museum) pp.127-128.

French J. 1986, 'Animal remains', p.75 in Rudkin D.J. (ed.), 'The excavation of a Romano-British site by Chichester Harbour, Fishbourne', *Sussex Archaeological Collections* **124**, 51-77.

Frere S.S. 1987, *Britannia: A History of Roman Britain*. Third Edition (London, Pimlico).

Fulford M. 1989, *Silchester: Excavations on the Defences 1974-80*, Britannia Monograph Series No.**5** (London, Society for the Promotion of Roman Studies).

Fulford M. 2001, 'Links with the past: pervasive 'ritual' burial behaviour in Roman Britain', *Britannia* **32**, 199-218.

Game A. 2001, 'Riding: embodying the centaur', *Body and Society* **7.1**, 1-12.

Gebbels A. 1976, 'The animal bones' in Bell M. (ed.), 'The excavation of an early Romano-British site and Pleistocene landforms at Newhaven, Sussex', *Sussex Archaeological Collections* **114**, 253-5.

Gebbels A. 1977, 'The animal bones', pp.277-84 in Bell M. (ed.), 'Excavations at Bishopstone', *Sussex Archaeological Collections* **115**.

Germany M. 2003, *Excavations at Great Holts Farm, Boreham , Essex, 1992-1994.* East Anglian Archaeology **105** (Essex County Council).

Getty, R. 1975, *Sisson and Grossman's the Anatomy of the Domestic Animals* (Philadelphia, WB Saunders).

Gidney L.J. 1991, Leicester, the Shires 1988 excavations: the animal bones from the Roman deposits at Little Lane, English Heritage, Ancient Monuments Laboratory Report 56/91.

Gidney L.G. 1999 'Animal bones', in Bishop L.C., 'An Iron-Age and Romano-British ladder settlement at Melton, East Yorkshire', *Yorkshire Archaeological Journal* **71**, 54-58.

Gidney L.J. 2003, 'The animal bones from the hospital and barrack XII' in Hodgson N. (ed.), *The Roman Fort at Wallsend (Segedunum): Excavations in 1997-8.* Tyne and Wear Museums Archaeological Monograph **2** (Newcastle, Tyne and Wear Museums) pp.231-240.

Gilbert J.M. 1979, *Hunting and Hunting Reserves in Medieval Scotland* (Edinburgh, Humanities Press).

Giles M. 2007, 'Good fences make good neighbours? Exporing the ladder enclosures of late Iron Age East Yorkshire' in Haselgrove C. and Moore T. (eds.), *The Later Iron Age in Britain and Beyond* (Oxford, Oxbow Books) pp. 235-249.

Giles M. and Parker Pearson M. 1999, 'Learing to live in the Iron Age: dwelling and praxis', in Bevan B. (ed.), *Northern exposure: interpretative devolution and the Iron Ages in Britain,* Leicester archaeology monographs no. **4** (Leicester).

Gilhus I.S. 2006, *Animals, Gods and Humans: Changing Attitudes to Animals in Greek, Roman and Early Christian Ideas* (London, Routledge).

Gonyou H.W. 2001, 'The social behaviour of pigs' in Keeling L.J. and Gonyou H.W. (eds.), *Social Behaviour in Farm Animals* (Wallingford, CABI Publishing) pp. 147-176.

Gosden C. 1994, *Social Being and Time* (Oxford, Blackwell).

Gosden C. 1997, 'Landscapes and cultural biographies' in Gwilt A. and Haselgrove C. (eds.), *Reconstructing Iron Age Societies.* Oxbow Monographs **71** (Oxford, Oxbow Books) pp.303-307.

Gosden C. and Lock G. 1998, 'Prehistoric histories', *World Archaeology* **30**, 2-12.

Grant A. 1971, 'The animal bones' in Cunliffe B. (ed.), *Excavations at Fishbourne 1961-1969,* Report to the Research Committee of the Society of Antiquaries of London No.**28** (Leeds, Society of Antiquaries of London) pp.377-388.

Grant A. 1975, 'The faunal remains' in Cunliffe B. (ed.), *Excavations at Portchester Castle 1: Roman.* Reports of the Research Committee **32** (London, Society of Anitiquities of London) pp.378-406.

Grant A. 1978, 'Animal bones', pp.32-36 in Bradley R. (ed.) 'Rescue excavations in Dorchester-on-Thames, 1972', *Oxoniensia* **43**, 17-39.

Grant A. 1981, 'The significance of deer remains at occupation sites of the Iron Age to the Anglo-Saxon period' in Jones M. and Dimbelby G.W. (eds.), *The Environment of Man: The Iron Age to the Anglo-Saxon Period,* BAR British Series **87** (Oxford, British Archaeological Reports) pp.205-13.

Grant A. 1982, 'The use of tooth wear as a guide to the age of domestic ungulates' in Wilson B., Grigson C. and Payne S. (eds.), *Ageing and Sexing Animal Bones from Archaeological Sites,* BAR British Series **109** (Oxford, British Archaeological Reports) pp.91-108.

Grant A. 1983, 'The animal bones' in Johnson S. (ed.), *Burgh Castle, Excavations by Charles Green 1958-61.* East Anglian Archaeology Report **20** (Dereham, Norfolk Archaeological Unit) pp.108-111.

Grant A. 1984a, 'Animal bones' in Cunliffe B. and Poole C. (eds.), *Danebury: an Iron Age hillfort in Hampshire, Vol. 3, The Excavations, 1969-78: the finds*, CBA Research Report **52** (London, Council for British Archaeology) pp.496-547.

Grant A. 1984b, 'Animal husbandry in Wessex and the Thames Valley' in Cunliffe B.W. and Miles D. (eds.), *Aspects of the Iron Age in Central Southern Britain.* OUCA Monograph **2** (Oxford, Oxford University Press) pp.102-119.

Grant A. 1985, 'The animal bones' in Cunliffe B. and Davenport P. (eds.), *The Temple of Sulis Minerva at Bath: vol.I - The site* (Oxford, Oxford University Committee for Archaeology) microfiche.

Grant A. 1987, 'The animal bones' in Cunliffe B. (ed.), *Hengistbury Head, Dorset, vol.I: The Prehistoric and Roman Settlement 3500BC-AD500* (Oxford, Oxford University for Archaeology) pp.322-323.

Grant A. 1989, 'Animals in Roman Britain' in Todd M. (ed.), *Research on Roman Britain 1960-1989.* Britannia Monograph Series **11** (London, Society for the Promotion of Roman Studies) pp.135-146.

Grant A. 1991, 'The animal bones' in Cunliffe B. and Poole C. (eds.), *Danebury: An Iron Age Hillfort in Hampshire, Vol. 5, The Excavations, 1979-88: the finds*, CBA Research Report **73** (London, Council for British Archaeology) pp.447-487.

Grant A. 2000, 'Diet, economy and ritual: evidence from the faunal remains' in Fulford M. and Timby J. (eds.), *Late Iron Age and Roman Silchester: Excavations on the Site of the Forum-Basilica 1977,1980-86.* Britannia Monograph Series No.**15** (London, Society for the Promotion of Roman Studies) pp.425-482.

Grant A. 2002 'Food, status and social hierarchy' in Miracle P. and Milner N. (eds.), *Consuming Passions and Patterns of Consumption*, (Cambridge, McDonald Institute for Archaeological Research) pp. 17-23.

Grayson D.K. 1984, *Quantitative Zooarchaeology* (London, Academic Press).

Green M. 1992, *Animals in Celtic Life and Myth* (London, Routledge).

Green M. 1993, *Celtic Myths* (London, British Museum Press).

Green M. 2004, *An Archaeology of Images. Iconology and Cosmology in Iron Age and Roman Europe* (London, Routledge/Taylor & Francis).

Greene C.M.C. 1996, 'Did the Romans hunt?', *Classical Antiquity* **15.2**, 222-260.

Grimes W.F. and Close-Brookes J. 1993, 'The excavation of Caesar's Camp, Heathrow, Harmondsworth, Middlesex, 1944', *Proceedings of the Prehistoric Society* **59**, 303-360.

Grimm J.M. 2006, Dorchester Hospital: Animal Bone Report (56530). Unpublished Report for Wessex Archaeology.

Grimm J.M. 2007, Colchester Balkerne Heights: Animal Bone Report (55025). Unpublished Report for Wessex Archaeology.

Gwilt A. and Haselgrove C. (eds.) 1997, *Reconstructing Iron Age Societies*. Oxbow Monograph **71** (Oxford, Oxbow).

Haglund-Calley L. and Cornwall I.W. 1963, 'Report on the Dinas Powys animal bones' in Alcock L. 1963, *Dinas Powys: An Iron Age, Dark Age and Early Medieval Site in Glamorgan* (Cardiff, University of Wales Press) pp.191-194.

Halstead P. 1996, 'Pastoralism or household herding? Problems of scale and specialisation in early Greek animal husbandry', *World Archaeology* **28**, 20-42.

Hambleton E. 1999, *Animal Husbandry Regimes in Iron Age Britain: A Comparative Study of Faunal Assemblages from British Iron Age Sites*, BAR British Series **282** (Oxford, British Archaeological Report).

Hambleton E. 2004, 'Faunal remains', pp.89-90 in Walker G., Thomas A. and Bateman C. (eds.), 'Bronze Age and Romano-British sites southeast of Tewkesbury: evaluations and excavations 1991-7', *Transactions of the Bristol and Gloucestershire Archaeological Society* **122**, 29-94.

Hambleton E., 2008. *Review of Middle Bronze Age - Late Iron Age Faunal Assemblages from Southern Britain*. English Heritage Project Report.

Hamilakis Y. 2003, 'The sacred geography of hunting: wild animals, social power and gender in early farming societies' in Kotjabopoulou E., Hamilakis Y., Halstead P., Gamble C. and Elephanti V. (eds.), *Zooarchaeology in Greece: Recent Advances* (London, British School at Athens) pp.239-47.

Hamilakis, Y. and Konsolaki, E. 2004, 'Pigs for the gods: animal burnt sacrifices at Mycenaean sanctuaries', *Oxford Journal of Archaeology* **23.2**, 135-51.

Hamilton J. 1996, 'Animal bone' in Cracknell S. (ed.), *Roman Alcester: Defences and Defended Area.* CBA Research Report **106** (London, Council for British Archaeology) pp.126-127, microfiche F9-G14.

Hamilton J. 2000a, 'Animal bones' in Cunliffe B. and Poole C. (eds.), *Bury Hill, Upper Clatford, Hampshire, 1990. The Danebury Environs Programme: The Prehistory of a Wessex Landscape, volume 2, part 2* (Oxford, Institute of Archaeology) pp.67-73.

Hamilton J. 2000b, 'Animal bones' in Cunliffe B. and Poole C. (eds.), *Suddern Farm, Middle Wallop, Hampshire, 1991 and 1996. The Danebury Environs Programme: The Prehistory of a Wessex Landscape, volume 2, part 3* (Oxford, Institute of Archaeology) pp.175-193.

Hamilton J. 2000c, 'Animal bones' in Cunliffe B. and Poole C. (eds.), *Nettlebank Copse, Wherwell, Hampshire, 1993. The Danebury Environs Programme: The Prehistory of a Wessex Landscape, volume 2, part 5* (Oxford, Institute of Archaeology) pp.101-116.

Hamilton J. 2000d, 'Animal bones' in Cunliffe B. and Poole C. (eds.), *Houghton Down, Stockbridge, Hampshire, 1994. The Danebury Environs Programme: The Prehistory of a Wessex Landscape, volume 2, part 6* (Oxford, Institute of Archaeology) pp.131-146.

Hamilton-Dyer S. 1993a, 'The animal bone', pp.132-136 in Zienkiewicz J.D., Hillam J., Besly E., Dickinson B.M., Webster P.V., Fox S.A., Hamilton-Dyer S., Caseldine A.E., Busby P.A. (ed.), 'Excavations in the *Scamnum Tribunorum* at Caerleon: The Legionary Museum Site 1983-5', *Britannia* **24**, 27-140.

Hamilton-Dyer 1993b, 'Animal bones' in Smith R.J.C. (ed.), *Excavations at County Hall, Colliton Park, Dorchester, Dorset, 1988, in the North-West Quarter of Durnovaria*. Wessex Archaeology Report No.**4** (Salisbury, Trust for Wessex Archaeology) pp.77-82.

Hamilton-Dyer S. 1994, 'The animal bone', pp.185-188/microfiche 1: 1-51 in Fulford M.G. and Rippon S.J. (eds.), 'Lowbury Hill, Oxon: a re-assessment of the probable Romano-Celtic temple and the Anglo-Saxon barrow', *Archaeological Journal* **151**, 158-211.

Hamilton-Dyer S. 1999, 'Animal bones' in Hearne C.M and Birbeck V. (eds.), *A35 Tolpuddle to Puddleton Bypass DBFO, Dorset, 1996-8: Incorporating Excavations at Tolpuddle Ball 1993*; Wessex Archaeology Report no.**15** (Salisbury, Trust for Wessex Archaeology Ltd.) pp.188-201.

Hamilton-Dyer S. 2002, 'Economic evidence: the animal bone assemblage', pp.7-10 in Gardiner J., Allen M.J., Hamilton-Dyer S., Laidlaw M. and Scaife R. (eds.), 'Making the most of it: late prehistoric pastoralism in the Avon Levels, Severn Estuary', *Proceedings of the Prehistoric Society* **68**, 1-39.

Hamilton-Dyer S. 2004, 'Animal Bones', pp.57-58 in Raymond F. (ed.), 'River Lavant Culvert: excavations in Market Road (St. John's Street) Car Park, Chichester, 1996', *Sussex Archaeological Collections* **142**, 45-61.

Hammon A. 2000, 'The animal bones' in Ferris I.M., Bevan L. and Cuttler R. (eds.), *The Excavation of a Romano-British Shrine at Orton's Pasture, Rocester, Staffordshire*. BAR British Series **314** (Oxford, Archaeopress) pp.61-7.

Hammon, A. 2008a 'Animal husbandry: an overview of the evidence from the animal bones', in Cunliffe, B *Overview: The Danebury Environs Roman Programme: A Wessex landscape during the Roman era, volume 1*. Oxford University School of Archaeology, Monograph **71** (Oxford, English Heritage) pp.74-100

Hammon, A. 2008b 'The animal bones', in Cunliffe, B and Poole, C. (eds.), *Houghton Down, Longstock, Hants, 1997: The Danebury Environs Roman Programme: A Wessex Landscape during the Roman era, volume 2 – part 1*. Oxford University School of Archaeology, Monograph **71** (Oxford, English Heritage) pp.97-111; E-text 1.6, the animal bones: data (www.arch.ox.ac.uk/research_projects/danebury)

Hammon, A. 2008c 'The animal bones', in Cunliffe, B and Poole, C. (Eds.), Grateley *South, Grateley, Hants, 1998 and 1999: The Danebury Environs Roman Programme: A Wessex landscape during the Roman era, volume 2 – part 2.* Oxford University School of Archaeology, Monograph **71** (Oxford, English Heritage) pp.149-166; E-text 2.5, the animal bones: data (www.arch.ox.ac.uk/research_projects/danebury)

Hammon, A 2008d 'The animal bones', in Cunliffe, B and Poole, C. (eds.), *Fullerton, Hants, 2000 and 2001: The Danebury Environs Roman Programme: A Wessex landscape during the Roman era, volume 2 – part 3.* Oxford University School of Archaeology, Monograph **71** (Oxford, English Heritage) pp.150-161; E-text 3.4, the animal bones: data (www.arch.ox.ac.uk/research_projects/danebury)

Hammon, A 2008e 'The animal bones', in Cunliffe, B and Poole, C. (eds.), *Thruxton, Hants, 2002: The Danebury Environs Roman Programme: A Wessex landscape during the Roman era, volume 2 – part 4.* Oxford University School of Archaeology, Monograph **71** (Oxford, English Heritage) pp.87-101; E-text 4.4, the animal bones: data (www.arch.ox.ac.uk/research_projects/danebury)

Hammon, A 2008f 'The animal bones', in Cunliffe, B and Poole, C. (eds.), *Flint Farm, Goodworth, Clatford, Hants, 2004: The Danebury Environs Roman Programme: A Wessex landscape during the Roman era, volume 2 – part 6.* Oxford University School of Archaeology, Monograph **71** (Oxford, English Heritage) pp.88-99; E-text 6.3, the animal bones: data (www.arch.ox.ac.uk/research_projects/danebury)

Hamshaw-Thomas J.F. 1993, 'Analysis of faunal remains' in Hands A.R. (ed.), *The Romano-British Roadside Settlement at Wilcote, Oxfordshire: Excavations 1990-92.* BAR British Series **232** (Oxford, Tempus Reparatum) pp.167-210.

Hamshaw-Thomas J. 2000, 'When in Britain do as the Britons do: dietary identity in early Roman Britain' in Rowley-Conwy P. (ed.), *Animal Bones, Human Societies* (Oxford, Oxbow) pp.166-169.

Hanson W.S. 1997, 'Forces of change and methods of control' in Mattingly D. (ed.), *Dialogues in Roman Imperialism: Power, Discourse and Discrepant Experiences in the Roman Empire.* Journal of Roman Archaeology Supplementary series **23** (Portsmouth, Rhode Island) pp.67-80.

Harcourt R. 1974, 'The dog in prehistoric and early historic Britain', *Journal of Archaeological Science* **1**, 151-175.

Harcourt R. 1979, 'The animal bones', in Wainwright G. (ed.), *Gussage All Saints: An Iron Age Settlement in Dorset* (London, H.M.S.O.) pp.150-160.

Harman M. 1993, 'Mammal bones' in Darling, M.J., and Gurney, D, *Caistor-on-Sea: Excavations by Charles Green 1951-1955*. East Anglian Archaeology Report **60** (Dereham, Norfolk Museums Service) pp.223-239.

Harman M. 1994, 'Mammal and bird bones' in Leary R.S. (ed.), *Excavations at the Romano-British Settlement at Pasture Lodge Farm, Long Bennington, Lincolnshire, 1975-77 by H.M. Wheeler.* Occasional Papers in Lincolnshire History and Archaeology **10** (Nottingham, Trent and Peak Archaeological Trust) pp.49-53.

Harman M. 1996, 'Mammal bones' in May J. (ed.), *Dragonby: Report on Excavations at an Iron Age and Romano-British Settlement in North Lincolnshire.* Oxbow Monographs **61**, vol.2 (Oxford, Oxbow) pp.141-65.

Harman M. 2007, 'Faunal remains', in Miles D., Palmer S., Smith A. and Perpetua Jones P. (eds.), *Iron Age and Roman Settlement in the Upper Thames Valley, Excavations at Claydon Pike and other Sites within the Cotswold Water Park.* Thames Valley Landscapes Monograph No.26 (Oxford, Oxford University School of Archaeology) p.292.

Haselgrove C. 1982, 'Wealth, prestige and power: the dynamics of late Iron Age political centralization in south-east England' in Renfrew C. and Shennan S. (eds.), *Ranking, Resource and Exchange* (Cambridge, Cambridge University Press) pp.79-88.

Haselgrove C. 1989. The later Iron Age in southern Britain and beyond, in M Todd (ed), *Research on Roman Britain 1960-89.* Britannia Monograph **11** (London, Society for the Promotion of Roman Studies) pp.1-18.

Haselgrove C., Armit I., Champion T.C., Creighton J., Gwilt, A., Hill J.D., Hunter F. and Woodward A. 2001, *Understanding the British Iron Age: An Agenda for Action.* A Report for the Iron Age Research Seminar and the Council of the Prehistoric Society (Salisbury, Trust for Wessex Archaeology).

Haselgrove C. and Moore, T. (eds.) 2007, *The Later Iron Age in Britain and Beyond* (Oxford, Oxbow).

Haverfield F. 1905, 'The Romanization of Roman Britain', *Proceedings of the British Academy 1905-6*, 185-217.

Hawkes C.F.C. 1959, 'The ABC of the British Iron Age', *Antiquity* **33**, 170-182.

Hayden B. 1996, 'Feasting in prehistoric societies' in Wiessner P. and Schiefenhovel W. (eds.) *Food and the Status Quest: An Interdisciplinary Perspective* (Providence, Berghahn), pp.127-49.

Hayes B.C. and Marangudakis M. 2001 'Religion and attitudes toward nature in Britain', *British Journal of Sociology* **52**, 139-155.

Held S., Mendl M., Devereux C. and Byrne R.W. 2000 'Social tactics of pigs in a competitive foraging task: the informed forager paradigm', *Animal Behaviour* **59**, 569–576.

Helms M.W 1988, *Ulysses' Sail: An Ethnographic Odyssey of Power, Knowledge and Geographical Distance* (New Jersey, Princeton University Press).

Helms M.W. 1993, *Craft and the Kingly Ideal: Art, Trade and Power* (Austin, University of Texas Press).

Hemsworth P.H. 2007 'Social factors influencing reproduction in pigs', *Reproduction in Domestic Animals* **31.1**, 181-186.

Henig M. 1995, *The Art of Roman Britain* (London, Batsford).

Henig M. 2003, 'Two intaglios', pp. 112-113 in Manley J. and Rudkin D. (eds.) *Facing the Palace: Excavations in front of the Roman Palace at Fishbourne. Sussex Archaeological Collections* **141** (Lewes, Sussex Archaeological Society).

Herskovits M.J. 1926 'The Cattle complex in East Africa', *American Anthropologist* **28.1**, 230-272.

Higbee L. 2006, 'Faunal remains' in Evans C. and Hodder I. (eds.), *Marshland Communities and Cultural Landscapes from the Bronze Age to the Present Day*. The Haddenham Project Volume 2 (Cambridge, McDonald Institute for Archaeological Research) pp.83-86.

Higgs E. and Vita-Finzi C. 1972 'Prehistoric economies: a territorial approach', in E. Higgs (ed.), *Papers in Economic Prehistory* (London) pp. 27-36.

Higham N.J. 1991, 'Soldiers and settlement in northern England' in Jones R.F.J. (ed.), *Britain in the Roman Period: Recent Trends* (Sheffield, J.R Collis) pp.93-102.

Hill J.D. 1995, *Ritual and Rubbish in the Iron Age of Wessex*. BAR British Series **242** (Oxford, Archaeopress).

Hill J.D. 1999, 'Settlement, landscape and regionality: Norfolk and Suffolk in the pre-Roman Iron Age of Britain and beyond' in Davis J.A. and Williamson T. (eds.), *Land of the Iceni: The Iron Age in Northern East Anglia* (Norwich, Studies in East Anglia History 4) pp.185-207.

Hill J.D. 2007, 'The dynamics of social change in later Iron Age eastern and south-eastern England c.300BC-AD43' in Haselgrove C. and Moore T. (eds.), *The Later Iron Age in Britain and Beyond* (Oxford, Oxbow) pp.16-40.

Hillson S. 1996, *Mammal Bones and Teeth: An Introductory Guide to Methods of Identification* (London, University College London Institute of Archaeology Publication).

Hillson S. 2005, *Teeth*. Cambridge Manuals in Archaeology Series (Cambridge, University Press).

Hingley R. 1989, *Rural Settlement in Roman Britain* (London, Seaby).

Hingley R. 1997, 'Resistance and domination: social change in Roman Britain' in Mattingly D. (ed.), *Dialogues in Roman Imperialism: Power, Discourse and Discrepant Experiences in the Roman Empire*, Journal of Roman Archaeology Supplementary series **23** (Portsmouth, Rhode Island) pp.81-100.

Hingley R. 2005, *Globalising Roman Culture: Unity, Diversity and Empire* (London, Routledge).

Hodder I. 1982, *Symbols in Action: Ethnoarchaeological Studies of Material Culture* (Cambridge, Cambridge University Press).

Holgate R. (ed.) 1986, 'Excavations at the late prehistoric and Romano-British enclosure complex at Carne's Seat, Goodwood, West Sussex, 1984', *Sussex Archaeological Collections* **124**, 35-50.

Holmes M. and Reilly K. 1994, 'The animal bone from the Mausoleum site' in Williams R.J. and Zeepvat R.J. (eds.), *Bancroft: A late Bronze Age/Iron Age Settlement, Roman Villa and Temple-Mausoleum: Volume II, Finds and Environmental Evidence.* Buckinghamshire Monograph Series 7 (Aylesbury, Buckinghamshire Archaeological Society) pp.515-536.

Howard M. 1963, *The Metrical Determination of the Metapodials and Skulls of Cattle* (London, Royal Anthropological Institute).

Hughes J.D. 2003, 'Europe as consumer of exotic biodiversity: Greek and Roman times', *Landscape Research* **28.1**, 21-31.

Humphrey J.H. 1991, *Literacy in the Roman World* (Ann Arbor, University of Michigan).

Hunter F. 1997, 'Iron Age hoarding in Scotland and northern England' in Gwilt A. and Haselgrove C. (eds.), *Reconstructing Iron Age Societies.* Oxbow Monographs **71** (Oxford, Oxbow Books) pp.108-133.

Hunter P. n.d., 'The faunal remains at Batten Hanger and Watergate Hanger villas', Unpublished report to Chichester District Council.

Hyland A. 1990, *Equus: The Horse in the Roman World* (New Haven, Yale University Press).

Iles M. and Clark K. 2005, 'The animal bone', pp.215-218 in Thomas N. (ed.), *Conderton Camp, Worcestershire: A Small Middle Iron Age Hillfort on Bredon Hill.* CBA Research Report **143** (York, Council for British Archaeology) pp.181-223.

Ingold T. 1990, 'An anthropologist looks at biology', *Man* **25**, 208-229.

Ingold T. 2000, *The Perception of the Environment: Essays in Livelyhood, Dwelling and Skill* (Abingdon, Routledge).

Ingrem C. 2003, 'Animal bone' in Miles D., Palmer S., Lock G., Gosden C. and Cromarty A.M. (eds.), *Uffington White Horse, Uffington, 1989-95 and Tower Hill, Ashbury, 1993-4.* Thames Valley Landscapes Monograph **18** (Oxford, Oxford Archaeology) pp.187-191.

Ingrem C. 2004, 'Assessment of the animal bone from Roman deposits at Westward House, Chichester, Sussex', Unpublished report to Chichester District Council.

Ingrem C. 2006, 'The animal bone' in Fulford M., Clarke A. and Eckardt H. (eds.), *Life and Labour in Late Roman Silchester: Excavations in Insula IX since 1997.* Britannia Monograph Series No.**22** (London, Society for the Promotion of Roman Studies) pp.167-188.

Ingrem C. 2009, 'Animal bone', pp.87-91 in Taylor A. (ed.), 'Excavation of a middle Iron Age settlement at Kingsmead South, Milton Keynes, Buckinghamshire, 2004-5', *Records of Buckinghamshire* **49**, 74-97.

Irving B. 1998, 'Animal bone', pp.349-350 in Barber L. (ed.), 'An early Romano-British salt-working site at Scotney Court', *Archaeologia Cantiana* **118**, 327-353.

Ivarsdotter A. 2004, 'And the cattle follow her, for they know her voice...On communication between women and cattle in Scandinavian pastures', in Frizell B.S. (ed.), *Man and Animal in Antiquity.* Proceedings of the Conference at the Swedish Institute in Rome, September 9-12, 2002 (Rome, The Swedish Institute) pp.146-149.

Izard K. 1997, 'The animal bones' in Wilmott T. (ed.), *Birdoswald: Excavations of a Roman Fort on Hadrian's Wall and its Successor Settlements: 1987-92.* English Heritage Archaeological Report **14** (London, English Heritage) pp.363-370.

Izjereef F.G. 1989, 'Social differentiation from animal bone studies', in Waldron T. and Serjeantson D. (eds.), *Diet and Crafts in Towns: The Evidence of Animal Remains from the Roman to the Post-Medieval Periods.* BAR British Series **199** (Oxford, British Archaeological Report) pp.41-53.

James S. 1999, *The Ancient Celts: Ancient People or Modern Invention?* (London, British Museum Press).

James S. 2001, 'Romanization' and the peoples of Britain' in Keay S. and Terrenato N. (eds.), *Italy and the West, Comparative Issues in Romanization* (Oxford, Oxbow) pp.187-209.

Jarman M.R. 1972, 'A territorial model for archaeology: a behavioural and geographical approach' in Clarke D.L. (ed.), *Models in Archaeology* (London, Routledge) pp.705-733.

Jarman M., Fagg A. and Higgs E.S. 1968, 'Animal bones', pp.182-189 in Stead I.M., 'An Iron Age hillfort at Grimthorpe, Yorkshire', *England Proceedings of the Prehistoric Society* **34**, 148–190.

Jay M. 2008, 'Iron Age diet at Glastonbury Lake Village: the isotopic evidence for negligible aquatic resource consumption', *Oxford Journal of Archaeology* **27.2**, 201-206.

Jay M. and Richards M.P. 2008 'Diet in the Iron Age cemetery population of Wetwang Slack, East Yorkshire, UK: carbon and nitrogen stable isotope evidence', *Journal of Archaeological Science* **33.5**, 653-662.

Jewel P.A. 1963, 'Cattle from British archaeological sites', in Mourant A.E. and Zeuner F.E. (eds), *Man and cattle*, Royal Anthropological Institute Occasional Paper **18**, pp. 80-101.

Jewell P. A. 1974, *Island Survivors: the Ecology of the Soay Sheep of St Kilda* (London, Athlone Press).

Johnson M. 2007, *Ideas of Landscape* (Oxford, Blackwell).

Johnstone C. 2004, A Biometric Study of Equids in the Roman World. Unpublished PhD Thesis, University of York.

Johnstone C. 2008 'Commodities or logistics? The role of equids in Roman supply networks' in Stallibrass S. and Thomas R. (eds.), *Feeding the Roman Army: the Archaeology of Production and Supply in NW Europe* (Oxford, Oxbow) pp.128-145.

Johnstone C. 2010, 'Donkeys and mules' in O'Connor, T.P and Sykes N.J. (eds.) *Extinctions and Invasions: The Social History of British Fauna* (Oxford, Oxbow).

Johnstone C. and Albarella U. 2002, 'The late Iron Age and Romano-British Mammal and Bird Bones Assemblage from Elms Farm, Heybridge, Essex', English Heritage: Ancient Monuments Laboratory Report, 45/02.

Jones A. 1998 'Where eagles dare. Landscape, animals and the Neolithic of Orkney', *Journal of Material Culture* **3.3**, 301-324.

Jones A.K.G. 1977, 'The fish bones' pp.284-285, in Bell M. (ed.), 'Excavations at Bishopstone', *Sussex Archaeological Collections* **115**.

Jones A.K.G. 1978, 'The fish remains' in Dennis G. (ed.), *1-7 St Thomas Street. Southwark Excavations 1972-4, part II.* Joint publication No.1 (London, London and Middlesex Archaeological Society and Surrey Archaeological Society) pp.414-416.

Jones A.K.G. 1988a, 'Fish bones from excavations in the Cemetery of St Mary Bishophill Junior' in O'Connor T.P., *Bones from the General Accident Site, Tanner Row.* The Archaeology of York, Volume **15**: The Animal Bones (London, Council for British Archaeology) pp.126-130.

Jones A.K.G. 1988b, 'Fish bones (199 Borough High Street)' in Hinton P. (ed.), *Excavation in Southwark 1973-76, Lambeth 1973-9.* Joint Publication No.3 (London, London and Middlesex Archaeological Society and Surrey Archaeological Society) pp.431-433.

Jones A.K.G. 1997, 'Fishes' in Hostetter E. and Howe T.N. (eds.), *The Romano-British Villa at Castle Copse, Great Bedwyn* (Indianopolis, Indiana University Press) pp.334-335.

Jones A.K.G. 2001, The fish remains from Dee House, Chester. Unpublished report.

Jones G. 2006, 'Tooth eruption and wear observed in live sheep from Butser Hill, the Cotswold Farm Park and five farms in the Pentland Hills, UK' in Ruscillo D. (ed.), *Recent Advances in Ageing and Sexing Animal Bones* (Oxford, Oxbow) pp. 155-178.

Jones M.K. 1981, 'The development of crop husbandry' in Jones M. and Dimbleby G. (eds.), *The Environment of Man: the Iron Age to the Anglo-Saxon period*. BAR British Series **87** (Oxford, British Archaeological Reports) pp. 95–127.

Jones M.K. 1982, 'Crop production in Roman Britain' in Miles D. (ed.), *The Romano-British Countryside: Studies in Rural Settlement and Economy*. BAR British Series **103** (Oxford, British Archaeological Reports) pp. 97–107.

Jones M. 1996, 'Plant exploitation' in Champion T.C. and Collis J.R. (eds.), *The Iron Age in Britain and Ireland: Recent Trends* (Sheffield, J.R. Collis publications) pp.29-40.

Jones M. 2007. *Feast: Why Humans Share Food* (Oxford, Oxford University Press).

Jones R. 1977, 'Animal bones', pp.58-66 in Smith K. (ed.), 'The excavation of Winklebury Camp, Basingstoke, Hampshire', *Proceedings of the Prehistoric Society* **43**, 31-130.

Jones R. 1986, 'Animal bone', p.79 in Hurst J.D. and Wacher J.S. (eds.), 'A multi-period site at Poxwell, Dorset', *Dorset Natural History and Archaeological Society Proceedings* **108**, 63-80.

Jones R., Langley P. and Wall S. 1985, 'The animal bones' in Hinchliffe J. and Sparey-Green C. (eds.), *Excavations at Brancaster 1974 and 1977*. East Anglian Archaeology Report **23** (Dereham, Norfolk Archaeological Unit) pp.132-174.

Jones R., Sly J., Beech M. and Parfitt S. 1988, 'Animal bones: summary' in Martin E. (ed.), *Burgh: The Iron Age and Roman enclosure*. East Anglian Archaeology Report **40** (Ipswich, Suffolk County Council) pp.66-67.

Jones R., Levitan B., Stevens P. and Malim T. 1990, 'The vertebrate remains' in Windell D. (ed.), *Excavations at Clay Lane 1980* (Northampton, Northamptonshire Archaeology Unit) pp.56-60.

Jordan P. 2001, 'The materiality of shamanism as a "world view": praxis, artefact and landscape' in Price N. (ed.), *An Archaeology of Shamanism* (London, Routledge) pp.87-104.

Kenny J. 1992, 'Fishbourne: excavation at the Westward House Site' in Woodward S. (ed.), *The Archaeology of Chichester and District 1992* (Chichester, Chichester District Council) pp.32-38.

Kent S. (ed.) 1989, *Farmers as Hunters: The Implications of Sedentism* (Cambridge, Cambridge University Press).

Kenyon K. 1954, 'Excavations at Sutton Walls, Herefordshire 1948-1951', *The Archaeological Journal* **110**, 1-87.

King A.C. 1978, 'A comparative survey of bone assemblages from Roman sites in Britain' *Bulletin of the Institute of Archaeology* **15**, 207-232.

King A.C. 1982, 'The animal bones' in Bennett P., Frere S. and Stow S., (eds.) *Excavations at Canterbury Castle. The Archaeology of Canterbury 1* (Maidstone, Kent Archaeological Society) pp.193-205.

King A.C. 1984 'Animal bones and the dietary identity of military and civilian groups in Roman Britain, Germany and Gaul' in Blagg T.F.C. and King A.C. (eds.), *Military and Civilian in Roman Britain. Cultural Relationships in a Frontier Province.* BAR British Series **136** (Oxford, British Archaeological Reports) pp.187-217.

King A.C. 1985, 'I resti animali: i mammiferi, i rettili e gli anfibi' in Carandini A. and Ricci A. (eds.), *Una Villa Schiavistica Nell'Etruria Romana* (Modena) pp.278-300.

King A.C. 1991, 'Food production and consumption – meat' in Jones R.F.J. (ed.), *Britain in the Roman Period: Recent Trends* (Sheffield, J.R Collis) pp.14-19.

King A.C. 1999a, 'Diet in the Roman World: a regional inter-site comparison of the mammal bones', *Journal of Roman Archaeology* **12**, 168-202.

King A.C. 1999b, 'Animals and the Roman army: the evidence of animal bones' in Goldsworthy A. and Haynes I. (eds.), *The Roman Army as a Community.* Journal of Roman Archaeology Supplementary series **34** (Portsmouth, Rhode Island) pp.139-49.

King A.C. 2004,'Mammal and bird bones' in Blagg T., Plouviez J. and Tester A. (eds.), *Excavations at a large Romano-British Settlement at Hacheston, Suffolk in 1973-4.* East

Anglian Archaeology Report **4** (Ipswich, Suffolk County Council Archaeological Service) pp.188-195.

King A 2005, 'Animal remains from temples in Roman Britain', *Britannia* **36**, 329-370.

King A.C. and Bedwin O. 1978, 'The animal bones', pp.340-342 in Bedwin O. and Pitts M.W. (eds.), 'The excavation of an Iron Age Settlement at North Bersted, Bognor Regis, West Sussex 1975-76', *Sussex Archaeological Collections* **116**, 293-347.

King A.C. and Soffe, G. 1994, 'The Iron Age and Roman temple on Hayling Island' in Fitzpatrick A. P. and Morris E. L. (eds.) *The Iron Age in Wessex: Recent Work* (Salisbury, Trust for Wessex Archaeology) pp.114-116.

King A.C. and Soffe G. 2001, 'Internal organisation and deposition at the Iron Age temple on Hayling Island, Hampshire' in Collis J.R. (ed.), *Society and Settlement in Iron Age Europe* (Actes du XVIIIe Colloque de l'AFEAF, Winchester, April 1994) (Sheffield, J.R. Collis publications) pp.111-124.

King J. 1996 'The animal bones' in Mackreth D.F. (ed.), *Orton Hall Farm: A Roman and Early Anglo-Saxon Farmstead.* East Anglian Archaeology Report No. **76** (Dereham, Norfolk Archaeology Unit) pp.216-219.

King J. 2001, 'Animal bone data' in Mackreth D.F. (ed.), *Monument 97, Orton Longueville, Cambridgeshire: a late Iron Age and early Roman Farmstead.* East Anglian Archaeology Report **97** (Manchester, Nene Valley Archaeological Trust), microfiche C9-D1.

Kinnes I.A. 1981, 'The animal bones' in Jarrett M.G. and Wrathmell S. (eds.) *Whitton: An Iron Age and Roman Farmstead in South Glamorgan* (Cardiff, University of Wales Press) pp.232-239.

Klein R.G. and Cruz-Uribe K. 1984, *The Analysis of Animal Bones from Archeological Sites* (Chicago, University of Chicago Press).

Knapp A.B. and Ashmore W. 1999, 'Archaeological landscapes: constructed, conceptualised, ideational' in Ashmore W. and Knapp A.B. (eds.), *Archaeologies of Landscape: Contemporary Perspectives* (Oxford, Blackwell Publishers Ltd.) pp.1-30.

Knight S. 2002, Butchery and Intra-site Spatial Analysis of Animal Bone: A Case Study from Danebury Hillfort, Hampshire, England. Unpublished PhD thesis, University of Leicester.

Knight S. 2007, 'Animal bones', pp.76-77 in Seager Smith R., Cooke N., Gale R., Knight S., McKinley J.I. and Stevens C. (eds.), 'Archaeological investigations on the site of the former Rowe's Garage, Chichester, West Sussex', *Sussex Archaeological Collections* **145**, 67-81.

Lane S.J., Alonso J.C. and Martín C.A. 2001 'Habitat preferences of great bustard *Otis tarda* flocks in the arable steppes of central Spain: are potentially suitable areas unoccupied?' *Journal of Applied Ecology* **38.1**, 193–203.

Lane-Fox R. 1996 'Ancient hunting: from Homer to Polybios' in Shipley G. and Salmon J. (eds.), *Human Landscapes in Classical Antiquity: Environment and Culture* (London, Routledge) pp.119-153.

Latour B. 2005, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford, Oxford University Press).

Lauwerier R. 1988, *Animals in Roman Times in the Dutch Eastern River Area.* Report No.12 (Nederlandse, Oudheden).

Leach E.R. 1964, 'Anthropological aspects of language: animal categories and verbal abuse' in Lenneberg E.H. (ed.), *New Directions in the Study of Language* (Massachusetts, Institute of Technology Press) pp.23-63.

Leach S., Lewis M., Chenery C., Eckardt H. and Müldner G. 2009, 'Migration and diversity in Roman Britain: a multidisciplinary approach to immigrants in Roman York, England', *American Journal of Physical Anthropology* **140**, 546-561.

Leach S., Eckardt H., Chenery C., Müldner G. and Lewis M. 2010, 'A 'lady' of York: migration, ethnicity and identity in Roman York', *Antiquity* **84**, 131-145.

Legge A.J. 1988 'The animal bones' in Moss-Eccardt J., Archaeological investigations in the Letchworth area, 1958-1974: Blackhorse Road, Letchworth; Norton Road, Baldock; Wilbury Hill, Letchworth, *Proceedings of the Cambridgeshire Antiquarian Society* **77**, 35-103.

Legge A.J., Williams J. and Williams P. 1991, 'The determination of season of death from the mandibles and bones of the domestic sheep (*Ovis aries*)', in Maggie R. Nisbet R. and Barker G. (eds.), *Archaeologia della Pastoria nell'Europa Meridionale 2 Rivista di Studi Liguri.* A.LVII, 1-4, pp.49-65.

Lepetz S. 1996, *L'animal dans la Société Gallo-Romain de la France du Nord* (Numerale Speciale, RA Picardie).

Lepetz S. 2002. Le Cheval, l'une et les Hybrides dans la Moitié Nord de la France la Période Romaine. Paper given at the workshop entitled 'Horse, Donkey and Co.' held in Basel, Switzerland, 23-24th January 2002.

Levi-Strauss C. 1966, *The Savage Mind* (University of Chicago Press).

Levine M.A. 1995, 'Animal bone', in Wymer J.J. and Brown N.R. (ed.), *Excavations at North Shoebury: Settlement and Economy in South-east Essex 1500 BC-AD1500.* East Anglian Archaeology Report No. **75** (Chelmsford, Essex County Council Archaeology Section) pp.130-41.

Levitan B. 1982, 'The faunal remains' in Leach P. (ed.), *Ilchester vol.1, Excavations 1974-5.* Western Archaeological Trust Monograph **3** (Bristol, Western Archaeological Trust) pp.269-85.

Levitan B. 1983, 'The animal remains', in Saville A. (ed.), *Uley Bury and. Norbury Hillforts.* Western Archaeological Trust Monograph **5** (Bristol, Western Archaeological Trust) Microfiche C6–D5.

Levitan B. 1989a, 'The vertebrate remains from Chichester Cattlemarket' in Down A. (ed.), *Chichester Excavations VI* (Chichester, Phillimore) pp.242-276.

Levitan B. 1989b, Assessment of three Iron Age assemblages from Gloucester. English Heritage, Ancient Monuments Laboratory Report 121/89.

Levitan B. 1989c, 'The animal bone' in Britnell J. (ed.), *Caersws Vicus, Powys: Excavations at the Old Primary School 1985-6*, BAR British Series **205** (Oxford, British Archaeological Reports) p.79.

Levitan B. 1993, 'The vertebrate remains' in Woodward A. and Leach P. (eds.), *The Uley Shrines: Excavations of a Ritual Complex on West Hill, Uley, Gloucestershire, 1977-79.* English Heritage Archaeological Report **17** (London, English Heritage) pp.257-301.

Levitan B. 1994, 'Vertebrate remains from the villa' in Williams R.J. and Zeepvat R.J. (eds.), *Bancroft: A late Bronze Age/Iron Age Settlement, Roman Villa and Temple-Mausoleum: Volume II, Finds and Environmental Evidence.* Buckinghamshire Archaeology Monograph Series **7** (Aylesbury, Buckinghamshire Archaeological Society).

Liddle J. 1988, The Fish: 2-5 Devonshire Square, London. Unpublished Museum of London Archaeology Service Archive Report.

Lock G. and Harris T. 2006, 'Enhancing predictive modeling: location, landscape, and culture' in Mehrer M.W. and Wescott K.L. (eds.) *GIS and Archaeological Site Location Modeling.* GIS and Archaeological Predictive Modeling Conference (Argonne National Laboratory) pp.41-62.

Locker A. 1979, 'Animal bones' pp.141, in Neale, D.S. 'Excavations at Little Somborne and Ashley', *Proceedings of the Hampshire Field Club and Archaeological Society* **36**, 91–144.

Locker A. 1981, Chichester, Sussex (CH/77/CS ES 29). The Fish Bones. Chichester District Council Unpublished archive report.

Locker A. 1984, 'The animal bone' in Philp B. (ed.), *Excavations in the Darent Valley, Kent* (Gloucester, Alan Sutton) microfiche 1-6.

Locker A. 1985, Castle Street, Carlisle: The Fish Remains. English Heritage, Ancient Monuments Laboratory Report 4510.

Locker A. 1986a, 'Colchester, Gilberd School: The Fish Bones', English Heritage, Ancient Monuments Laboratory Report 118/87.

Locker A. 1986b, Rangoon Street: The Fish Bones from Context 1238. Unpublished Museum of London Archaeology Service Archive Report.

Locker A. 1990 'The mammal, bird and fish bones' in Neal D.S., Wardle A. and Hunn J. (eds.), *Excavation of the Iron Age, Roman and Medieval Settlement at Gorhambury, St Albans*. English Heritage Archaeological Report **14** (London, English Heritage) pp.205-212.

Locker A. 1991, The Fish Bones from Calverts Buildings, 15-23 Southwark Street, London SE1. Unpublished Museum of London Archaeology Service Archive Report.

Locker A. 1992a, 'The fish bones' in Crummy P. (ed.), *Culver Street*. Colchester Archaeological Report **6** (Colchester, Colchester Archaeological Trust) pp.278-280.

Locker A. 1992b, The Fish Bones from Billingsgate 1982. Unpublished Museum of London Archaeology Service Archive Report.

Locker A. 1992c, The Fish Remains from Roman deposits in waterfront sites. Unpublished Museum of London Archaeology Service Archive Report.

Locker A. 1993, The Fish from Godmanchester. Unpublished Report (personal).

Locker A. 1994, The Fish Bones from Fleet Valley: Sites VAL88 and PWB 88. Unpublished Museum of London Archaeology Service Archive Report.

Locker A. 1997a, 'Appendix 9: fish bones' in Barker P., White R., Pretty K., Brid H. and Corbishley M. (eds.), *The Baths Basilica Wroxeter: Excavations 1966-90*. English Heritage Archaeological Report 8 (London, English Heritage) pp.365-367.

Locker A. 1997b, The Fish from Great Yard, Ilchester. Unpublished Report (personal).

Locker A. 1998a, The Fish from Lefevre Road, Bow. Unpublished Report for Environmental Archaeology Consultancy.

Locker A. 1998b, The Fish from Parnell Road, Bow. Unpublished Report for Environmental Archaeology Consultancy.

Locker A. 1999, 'Animal bones' in Niblett R. (ed.) *The Excavation of a Ceremonial Site at Folly Lane, Verulamium*. Britannia Monograph **14** (London, The Society for the Promotion of Roman Studies) pp.324-345.

Locker A., 2000, 'Animal bone,' in A.J. Lawson (ed.) *Potterne 1982–5: Animal Husbandry in later prehistoric Wiltshire* (Salisbury, Wessex Archaeology) pp.101–119.

Locker A. 2002, The Fish from Excavations at the Former Post Office, Head Street, Colchester. Unpublished Report for the Colchester Archaeological Trust.

Locker A. 2003, 'Fish bone' in Germany M. (ed.), *Excavations at Great Holts Farm, Boreham, Essex, 1992-94.* East Anglian Archaeology Report **105** (Chelmsford, Essex County Council) p.200.

Locker A. 2004, The Fish from Meppershall, Beds, LMB01. Unpublished Report for the Environmental Archaeology Consultancy.

Locker A. 2006, 'Animal bone', pp.75-76 in Hughes J. (ed.), 'Hanbury Street, Droitwich: excavations 1980-2', in Hurst D. (ed.), *Roman Droitwich: Dodderhill Fort, Bays Meadow Villa, and Roadside Settlement*, CBA Research Report **146** (York, Council for British Archaeology) pp.46-77.

Locker A. 2007, '*In Piscibus Diversis*: The bone evidence for fish consumption in Roman Britain', *Britannia* **38**, 141-180.

Locker A. n.d., The Fish from a Well at Beddington Roman Villa. Unpublished Report (personal).

Lokuruka M.N.I. 2006 'Meat is the meal and status is by meat: recognition of rank, wealth and respect through meat in Turkana culture', *Food and Foodways* **14**, 201-229.

Loney H.L. and Hoaen A.W. 2005, 'Landscape, memory and material culture: interpreting diversity in the Iron Age', *Proceedings of Prehistoric Society* **71**, 361-378.

Lorimer H. 2000, 'Guns, game and the grandee: The cultural politics of deerstalking in the Scottish Highlands', *Cultural Geographies* **7**, 403-431.

Lorimer H. 2006, 'Herding memories of humans and animals', *Environment and Planning D: Society and Space* **24**, 497-518.

Lovett J. 1990, 'Animal bone', pp.48–53 in Dinn J. and Evans J. (eds.), 'Aston Mill Farm, Kemerton: excavation of a ring-ditch, Middle Iron Age enclosures and a Grubenhaus', *Transactions of the Worcestershire Archaeology Society* **12.3**, pp.5–66.

Lowe J.J. and Walker M.J.C. 1997, *Reconstructing Quaternary Environments* (London, Longmans).

Lucy S. 2005 'Ethnic and cultural identities' in Díaz-Andreu M., Lucy S., Babić S. and Edwards D.N., *The Archaeology of Identity: Approaches to Gender, Age, Status, Ethnicity and Religion* (London, Routledge) pp. 86-109.

Luff R.M. 1985, 'The fauna' in Niblett R. (ed.), *Sheepen: An Early Roman Industrial Site at Camulodunum*. CBA Research Report **57** (London, Council for British Archaeology) pp.143-149.

Luff R.M. 1987, 'The animal bone' in Rodwell K.A. (ed.), *The Prehistoric and Roman Settlement at Kelvedon, Essex*. CBA Research Report **63** (London, Council for British Archaeology) pp.89-91.

Luff R.M. 1988, 'The faunal remains' in Drury P.J. (ed.), *The Mansio and Other Sites in the South-Eastern Sector of Caesaromagus.* CBA Research Report **66** (London, Council for British Archaeology) pp.118-122, microfiche 2D-E.

Luff R.M. 1992, 'The faunal remains' in Wickendon N.P. (ed.), *The Temple and Other Sites in the North-Eastern Sector of Caesaromagus.* Chelmsford Archaeological Trust Report **9**: CBA Research Report **75** (London, Council for British Archaeology) pp.116-124.

Luff R.M. 1993, *Animal Bones from Excavations in Colchester, 1971-85.* Colchester Archaeological Report **12** (Colchester Archaeological Trust).

Luff R.M. 1998, 'The faunal remains' in Clarke C.P. (ed.), *Excavations South of Chignall Roman Villa Essex, 1977-81* (Chelmsford, Essex County Council) pp.122-125.

Luff R.M. 1999, 'Animal and human bones' in Turner R. (ed.), *Excavations of an Iron Age Settlement and Roman Religious Complex at Ivy Chimneys, Witham, Essex 1978-83.* East Anglian Archaeology Report **88** (Chelsmford, East Anglian Archaeology) pp.204-223.

Lyman R.L. 1982, 'Archaeofaunas and subsistence studies', *Advances in Archaeological Method and Theory* **5**, 331-393.

Lyman R.L. 1994, *Vertebrate Taphonomy* (Cambridge, Cambridge University Press).

Lyman R.L. 2008, *Quantitative Paleozoology* (Cambridge, Cambridge University Press).

Lyne M. 2005, 'The pottery from the fills of the early ditch at Fishbourne', pp.64-75 in Manley J. and Rudkin D. (eds.), 'A Pre-AD43 ditch at Fishbourne Roman Palace, Chichester', *Britannia* **36**, 55-99.

Mackinnon M. 2001, 'High on the hog: linking zooarchaeological, literary, and artistic data for pig breeds in Roman Italy', *American Journal of Archaeology* **105.4**, 649-673.

Mackinnon M. 2004, *Production and Consumption of Animals in Roman Italy: Integrating the Zooarchaeological and Textual Evidence.* Journal of Roman Archaeology Supplementary Series **54** (Portsmouth, Rhode Island).

MacKinnon M. 2010 'Cattle "breed" variation and improvement in Roman Italy: connecting the zooarchaeological and ancient textual evidence', *World Archaeology* **42.1**, 55-73.

Macready S. and Sidell J. 1998, 'The animal bones' in Shepherd J. (ed.), *The Temple of Mithras, London: Excavations by W F Grimes and A Williams at the Walbrook.* English Heritage Archaeological Report **12** (London, English Heritage) pp.208-215.

Madgwick R. 2008, 'Patterns in the modification of animal and human bones in Iron Age Wessex: revisiting the excarnation debate', in Davis O.P., Sharples N.M. and Waddington K.E. (eds.), *Changing Perspectives on the First Millennium BC* (Oxford, Oxbow Books) pp.99-118.

Mainland I. 2008, 'The uses of archaeological faunal remains in landscape archaeology' in David B. and Thomas J. (eds.), *Handbook of Landscape Archaeology* (Left Coast Press*)*, pp.554-550.

Malamud R. 2007, 'Zoo spectatorship', in Kalof L. and Fitzgerald A.J., *The Animal Reader: The Essential Classics and Contemporary Writings* (Oxford, Berg) pp.219-236.

Maltby M. 1979, *The Animal Bones from Exeter 1971–75*. Exeter Archaeological Reports **2** (Sheffield, Department of Archaeology and Prehistory).

Maltby M. 1981a, 'Animal bone', pp.115-118 in Davies S.J.M. (ed.), 'Excavations at Old Down Farm, Andover', *Proceedings of the Hampshire Field Club and Archaeological Society* **37**, 81-163.

Maltby M. 1981b, 'Iron Age, Romano-British and Anglo-Saxon animal husbandry – A review of the faunal evidence' in Jones M. and Dimbelby G.W. (eds.), *The Environment of Man: The Iron Age to the Anglo-Saxon Period.* BAR British Series **87** (Oxford, British Archaeological Reports) pp.155-204.

Maltby M. 1983, 'The animal bone', in Millett M., 'Excavations at Cowdery's Down, Basingstoke, Hampshire, 1978-81', *Archaeological Journal* **140**, 258-259/151-279.

Maltby M. 1984a, 'Animal bones and the Romano-British economy', in Grigson C. and Clutton-Brock J. (eds.), *Animals and Archaeology: 4. Husbandry in Europe*, BAR International series **227** (Oxford, British Archaeological Report) pp.125-138.

Maltby M. 1984b, 'The animal bones' in Fulford M., *Silchester: Excavations on the Defences 1974-80.* Britannia Monograph Series No.**5** (London, Society for the Promotion of Roman Studies) pp.199-211.

Maltby M. 1984c, 'The animal bones from the Iron Age settlement at Chilbolton Down' in Catherall P.D., Barnett M. and McClean H. (eds.), *The Southern Feeder: The Archaeology of a Gas Pipeline* (London, The British Gas Corporation) pp.109-113.

Maltby M. 1985a, 'The animal bone' in Fasham P. (ed.), *The Prehistoric Settlement at Winnall Down, Winchester*. Hampshire Field Club Monograph No.**2** (Winchester, Hampshire Field Club) pp.97-112.

Maltby M. 1985b, 'Patterns of faunal assemblage variability' in Barker G. and Gamble C. (eds.), *Beyond Domestication in Prehistoric Europe* (London, Academic Press) pp.33-74.

Maltby M. 1986, The Animal Bones from the 1978 Excavations of the Late Iron Age and Early Romano-British Settlement at Abbotstone Down, near New Alresford, Hants. English Heritage: Ancient Monuments Laboratory Report, 58/86.

Maltby M. 1987, The Animal Bones from the Excavations at Owslebury, Hants., An Iron Age and early Romano-British settlement. English Heritage, Ancient Monuments Laboratory Report 6/87.

Maltby M. 1993, 'The animal bones' in Woodward P.J., Davies S.M. and Graham A.H (eds.), *Excavations at the Old Methodist Chapel and Greyhound Yard, Dorchester 1981-4* (Dorchester, Dorset Natural History and Archaeological Society) pp.315-40 and microfiche A2-D14.

Maltby M. 1994, 'The meat supply in Roman Dorchester and Winchester', in Hall A.R. and Kenward H.K. (eds.), *Urban-Rural Connexions: Perspectives from Environmental Archaeology* (Oxford, Oxbow) pp.85-102.

Maltby M. 1995, 'Animal bone' in Fasham P.J., Keevill G. and Coe D. (eds.), *Brighton Hill South (Hatch Warren): An Iron Age Farmstead and Deserted Medieval Village in Hampshire.* Wessex Archaeology Report 7 (Salisbury, Trust for Wessex Archaeology Ltd.) pp.49-56.

Maltby M. 1997, 'Domestic fowl on Romano-British sites: inter-site comparisons of abundance', *International Journal of Osteoarchaeology* 7, 402-414.

Maltby M. 1998a, 'Animal bones from Romano-British deposits in Cirencester' in Holbrook N. (ed.), *Cirencester Excavations V: The Roman Town Defences, Public Buildings and Shops* (Cirencester, Cotswold Archaeological Trust) pp.352-70.

Maltby M. 1998b, 'Animal bones from Kingcote' in Timby J.R (ed.), *Excavations at Kingscote and Wycomb, Gloucestershire: A Roman Estate Centre and Small Town in the Cotswolds with Notes on Related Settlements* (Cirencester, Cotswold Archaeological Trust) pp.421-428.

Maltby M. 2001, 'Faunal remains' in Booth P. and Evans J. (eds.), *Roman Alcester, Northern Extramural Area: 1969-88 Excavations*, CBA Research Report 127 (York, Council for British Archaeology) pp.265-290.

Maltby M. (ed.) 2006, *Integrating Zooarchaeology*. Proceedings of the 9th ICAZ Conference, Durham (Oxford, Oxbow).

Maltby M. 2007, 'Chop and change: specialist cattle carcass processing in Roman Britain' in Croxford B., Ray N., Roth R. and White N. (eds.), *TRAC 2006: Proceedings of the 16th Annual Theoretical Roman Archaeology Conference* (Oxford, Oxbow) pp.59-76.

Maltby M. 2008, 'Animal bone' in Luke M. (ed.), *Life in the Loop: Investigation of a Prehistoric and Romano-British Landscape at Biddenham Loop, Bedfordshire*. East Anglian Archaeology Report **125** (Bedford, Albion Archaeology) pp.118- 9; 152-153; 189-192; 238-239; 283-284.

Manley J. 2002, *AD43, The Roman Invasion of Britain: A Reassessment* (Stroud, Tempus).

Manley J. 2003, 'Inside/Outside: architecture and the individual at Fishbourne Roman Palace', in Rudling D. (ed.), *The Archaeology of Sussex to AD 2000* (King's Lynn, Heritage Books) pp.127–40.

Manley J. and Rudkin D. 2003, *Facing the Palace: Excavations in front of the Roman Palace at Fishbourne*. Sussex Archaeological Collections **141** (Lewes, Sussex Archaeological Society).

Manley J. and Rudkin D. 2005, 'A pre-AD 43 ditch at Fishbourne Roman Palace, Chichester', *Britannia* **36**, 55-99.

Manley J. and Rudkin D. 2006, 'More buildings facing the Palace', *Sussex Archaeological Collections* **144**, 69-113.

Manning W.H. 1971, 'The Piercebridge plough group', *The British Museum Quarterly* **35.1**, 125-136.

Marciniak A. 2005, *Placing Animals in the Neolithic* (London, UCL Press).

Mathews F. and Macdonald D.W. 2001, 'The sustainability of the common crane (*Grus grus*) flock breeding in Norfolk - insights from simulation modelling', *Biological Conservation* **100.3**, 323-333.

Mattingly D. (ed.) 1997a, *Dialogues in Roman Imperialism: Power, Discourse and Discrepant Experiences in the Roman Empire.* Journal of Roman Archaeology Supplementary Series **23** (Portsmouth, Rhode Island).

Mattingly D. 1997b, 'Africa: a landscape of opportunity?' in Mattingly D. (ed.), *Dialogues in Roman Imperialism: Power, Discourse and Discrepant Experiences in the Roman Empire.* Journal of Roman Archaeology Supplementary Series **23** (Portsmouth, Rhode Island) pp.117-139.

Mattingly D. 2006, *An Imperial Possession: Britain in the Roman Empire, 54BC – AD43* (London, Penguin).

McCormick F. 1992, 'Early faunal evidence for dairying', *Oxford Journal of Archaeology* **11**, 201-209.

Meddens B. 2000, 'The animal bone' in Ellis P. (ed.), *The Roman Baths and Macellum at Wroxeter: Excavations by Graham Webster 1955-85.* English Heritage Archaeological Report **9** (London, English Heritage) pp.315-355.

Meddens B.J. 2001, 'The animal bone', pp.163-168 in Meddens F.M., Beasley M., Lyne M., Sabel K.R., Keys L., Meddens B.J., Dodwell N., Keeley H.C.M, Godwin M., Scaife R.G. and Carruthers W.J. (eds.), 'Roman seasonal wetland pasture exploitation near Nash, on the Gwent Levels, Wales', *Britannia* **32**, 143-184.

Meniel P. 2002, 'La chasse en Gaule, une activité aristocratique?' *L'Aristocratie Celte à la Fin de l'Âge du Fer.* Collection Bribracte 5, Glux-en-Glenne. pp.223-230.

Menninger K.A. 1951, 'Totemic aspects of contemporary attitudes toward animals', in Wilber G.B. and Muensterberger W. (eds.), *Psychoanalysis and Culture: Essays in Honor of Geza Roheim* (New York, International Universities Press).

Metcalf P. and Huntington R. 1991, *Celebrations of Death, the Anthropology of Mortuary Ritual* (Cambridge, Cambridge University Press).

Michael B.J. 1987, 'Milk production and sales by the Hawazma (Baggara) of Sudan: implications for gender roles' in Isaac B.L. (ed.), *Research in Economic Anthropology* **9** (Greenwich, JAI Press) pp.105-141.

Miles D. and Palmer S. 1995 'White Horse Hill', *Current Archaeology* **142.XII.10**, 372–378.

Millett M. 1990, *The Romanisation of Britain: An Essay in Archaeological Interpretation* (Cambridge, Cambridge University Press).

Mitchell W.J.T. 1994, 'Imperial landscape' in Mitchell W.J.T. (ed.), *Landscape and Power* (London, Routledge) pp.5-14.

Mlekuž D. 2003, 'Early herders of the Eastern Adriatic', *Documenta Praehistorica* **30**, 139-151.

Mlekuž D. 2007, '"Sheep are your mother": Rhyta and the interspecies politics in the Neolithic of the eastern Adriatic', *Documenta Praehistorica* **34**, 267-280.

Moore T. 2007, 'Perceiving communities: exchange, landscapes and social networks in the later Iron Age of Western Britain', *Oxford Journal of Archaeology* **26.1**, 79-102.

Mooketsi C. 2001, 'Butchery styles and the processing of cattle carcasses in Botswana', *Pula Journal* **15.1**, 108-124.

Morris B. 2000, 'Wildlife depredations in Malawi: the historical dimension', in Knight J. (ed.), *People and Wildlife: Conflicts in Anthropological Perspective* (London, Routledge) pp.36-49.

Morris J. 2008, Re-examining Associated Bone Groups from Southern England and Yorkshire, c.4000BC to AD1550. Unpublished PhD Thesis, University of Bournemouth.

Morrison A. 2000, 'The animal bone' in Cooper N.J. (ed.), *The Archaeology of Rutland Water: Excavations at Empingham in the Gwash Valley, Rutland, 1967-73 and 1990.* Leicester Archaeology Monographs No.6 (Leicester, University of Leicester Archaeological Services) pp.132-136.

Mullin M.H. 1999, 'Mirrors and windows: sociocultural studies of human-animal relationships', *Annual Review of Anthropology* **28**, 201-224.

Mulville J. and Levitan B. 2004 'The animal bone', in Lambrick G. and Allen T.G. (eds.) *Gravelly Guy, Stanton Harcourt: The development of a Prehistoric and Romano-British Community* (Oxford, Oxford Archaeological Unit) pp. 263-479.

Murphy P., Albarella U., Germany M. and Locker A. 2000, 'Production, imports and status: Biological remains from a late Roman farm, Boreham, Essex, UK', *Environmental Archaeology* **5**, 35-48.

Murphy T. 2004, *Pliny the Elder's Natural History: The Empire in the Encyclopedia* (Oxford, Oxford University Press).

Niblett R. (ed.) 1999, *The Excavation of a Ceremonial Site at Folly Lane, Verulamium.* Britannia Monograph **14** (London, The Society for the Promotion of Roman Studies).

Nicholson R. 1993, The Fish Remains from Excavations at The Lanes, Carlisle. Unpublished Report, Environmental Archaeology Unit, University of York.

Nicholson R. 1995, 'The fish remains' in Andrews P. (ed.), *Excavations at Redcastle Furze, Thetford.* East Anglian Report **72** (Dereham, East Anglian Archaeology) pp.128-130.

Nicholson R.A. and Scott S.A. 2004, 'Animal remains' in Dalwood H. and Edwards R. (eds.), *Excavations at Deansway, Worcester, 1988-9: Romano-British Small Town to Late Medieval City*, CBA Research Report **139** (York, Council for British Archaeology) pp.506-534.

Noddle B. 1983, 'The animal bones' in Casey P.J. (ed.), 'Caerwent (*Venta Silurum*): the excavation of the northwest corner tower and an analysis of the structural sequence of the defences', *Archaeologia Cambrensis* **132**, 49-77.

Noddle B.A. 1984a, 'A comparison of the bones of cattle, sheep and pigs from ten Iron Age and Romano-British sites' in Grigson C. and Clutton-Brock J. (eds.), *Animals and Archaeology: 4. Husbandry in Europe.* BAR International Series **227** (Oxford, British Archaeological Reports).

Noddle B. 1984b, 'Animal bones' in Rawes B. (ed.), 'The Romano-British site on the Portway, near Gloucester', *Transactions of the Bristol and Gloucestershire Archaeological Society* **102**, 23-72.

Noddle B. 1985, 'The animal bones' in Webster G., Fowler P., Noddle B. and Smith L. (eds.), 'The excavation of a Romano-British rural establishment at Barnsley Park, Gloucestershire 1961-79: part III', *Transactions of the Bristol and Gloucestershire Archaeological Society* **103**, 73-100.

Noddle B. 1986, 'The animal bones' in Rawes B. (ed.), 'The Romano-British settlement at Haymes, Cleeve Hill, near Cheltenham', *Transactions of the Bristol and Gloucestershire Archaeological Society* **104**, 61-93.

Noddle B. 1991, 'Animal bones', pp.85-86 in Rawes B. (ed.), 'A Prehistoric and Romano-British settlement at Vineyards Farm, Charlton Kings, Gloucestershire', *Transactions of the Bristol and Gloucestershire Archaeological Society* **109**, 25-89.

Noddle B. 1992, 'Animal bone' in Rahtz P., Woodward A., Burrow I., Everton A., Watts L., Leach P., Hirst P., Fowler P. and Gardiner K. (eds.), *Cadbury Congresbury 1968–73: a late/post-Roman hilltop Settlement in Somerset.* BAR British Series **223** (Oxford, Archaeopress) pp.185-189.

Noddle B. 1993, 'Bones of larger mammals' in Casey P.J., Davies J.L. and Evans J. (eds.), *Excavations at Segontium (Caernarfon) Roman Fort, 1975-1979.* CBA Research Report **90** (London, Council for British Archaeology) pp.97-119.

Noddle B. 2000, 'Large vertebrate remains' in Price E. (ed.), *Frocester: A Romano- British Settlement, its Antecedents and Successors, vol.II: Finds* (Stonehouse, Gloucestershire and District Archaeological Research Group) pp.217-44.

Noddle B. 2006, 'Animal bone', pp.216-220 in Barfield L. (ed.), 'Bays Meadow Villa, Droitwich: excavations 1967-77' in Hurst D. (ed.), *Roman Droitwich: Dodderhill Fort, Bays Meadow Villa, and Roadside Settlement.* CBA Research Report **146** (York, Council for British Archaeology) pp.78-242.

Noddle B. and O'Connor T.P. 2002, 'The animal bone' in Webster G. (Chadderton J. Ed.), *The Legionary Fortress at Wroxeter: Excavations by Graham Webster, 1955-85.* English Heritage Archaeological Report **19** (London, English Heritage) pp.255-262.

O'Connor T.P. 1986, 'The animal bones' in Zienkiewicz J.D. (ed.), *The Legionary Fortress Baths at Caerleon, vol.II: the finds* (Gloucester, Alan Sutton) pp.224-248.

O'Connor T.P. 1988, *Bones from the General Accident Site, Tanner Row.* The Archaeology of York, Volume 15: The Animal Bones (London, Council for British Archaeology).

O'Connor T.P. 1992, 'Provisioning urban communities: a topic in search of a model', *Anthropozoologica (L'Homme et L'Animal)* **16**, 101-106.

O'Connor T.P. 1993, 'Bird bones' in Casey P.J., Davies J.L. and Evans J. (eds.), *Excavations at Segontium (Caernarfon) Roman Fort, 1975-1979.* CBA Research Report **90** (London, Council for British Archaeology) pp.119-120.

O'Connor T.P. 1998, 'On the difficulty of detecting seasonal slaughtering of sheep', *Environmental Archaeology* **3**, 5-11.

O'Connor T.P. 2000, *The Archaeology of Animal Bones* (Stroud, Sutton).

O'Connor T.P. 2007, 'Wild or domestic? Biometric variation in the cat *Felis silvestris* Schreber', *International Journal of Osteoarchaeology* **17**, 581–595.

O'Connor T.P. and Sykes N.J. (eds.) 2010, *Extinctions and Invasions: The Social History of British Fauna* (Oxford, Oxbow).

O'Neil H.E. 1945, 'The Roman villa at Park Street near St Albans, Herts. Report on the Excavations of 1943-45', *Archaeological Journal* **102**, 21-110.

O'Regan H.J. 2002, 'From bear pits to zoos', *British Archaeology* **68**, 12-129.

Orr C. 1974a, 'The animal bones – Moulton Park' in Williams J.H. (ed.), *Two Iron Age Sites in Northampton.* Northampton Development Corporation Archaeological Monographs No.1 (Northampton, Private Publication) p.43.

Orr C. 1974b, 'The animal bones – Blackthorn' in Williams J.H. (ed.), *Two Iron Age Sites in Northampton.* Northampton Development Corporation Archaeological Monographs No.1 (Northampton, Private Publication) p.62.

Osborn A.J. 1996, 'Cattle, co-wives, children, and calabashes: material context for symbol use among the II Chamus of west-central Kenya', *Journal of Anthropological Archaeology* **15**, 107-136.

O'Shea J.M. 1989, 'The role of wild resources in small-scale agricultural systems: tales from the lakes and the plains' in Halstead P. and O'Shea J.M. (eds.), *Bad Year Economics: Cultural Responses to Risk and Uncertainty* (Cambridge, Cambridge University Press) pp.57-67.

Oswald, A 1997 'A doorway on the past: practical and mystic concerns in the orientation of roundhouse doorways', in Gwilt A. and Haselgrove C. (eds.), *Reconstructing Iron Age Societies*. Oxbow Monograph **71** (Oxford, Oxbow) pp.87-95.

Outen A. 1979, 'The animal bones' in Down A. (ed.), *Chichester Excavations 4* (Chichester, Phillimore) pp.113-131.

Parker A. J. 1988, 'The birds of Roman Britain', *Oxford Journal of Archaeology* **7**, 197-226.

Payne S. 1973, 'Kill-off patterns in sheep and goats: The mandibles from Aşvan Kale', *Anatolian Studies* **23**, 281-303.

Payne S. 1997, 'Animal remains' in Hostetter E. and Howe T.N. (eds.), *The Romano-British Villa at Castle Copse, Great Bedwyn* (Indianopolis, Indiana University Press) pp.322-330.

Pentikainen J. 1998, 'The shamans and shamanism', in Jaatinen T., Lehtinen I., Pentikäinen J. and Saloniemi M. (eds.) *Shamans* (Tampere Museum Publications **45**), pp. 29–50.

Perring D. 2003, *The Roman House in Britain* (London, Duckworth).

Peters, J. 1998. *Römische Tierhaltung und Tierzucht: eine Synthese aus Archäozoologischer Untersuchung und Schriftlich-Bildlicher Überlieferung.* Passauer Universitätsschriften zu Archäologie Band 5. Rahden/Westfalen: Verlag Marie Leidorf.

Philo C. 1995, 'Animals, geography and the city. Notes on inclusions and exclusions', *Environment and Planning D: Society and Space* **13.6**, 655-81.

Philo C. and Wilbert C. 2000, 'Animal spaces and beastly places: an introduction' in Philo C. and Wilbert C. (eds.), *Animal Spaces and Beastly Places* (London, Routledge) pp.1-34.

Philpott R. 1991, *Burial Practices in Roman Britain: A Survey of Grave Treatment and. Furnishing A.D.43-410.* BAR British Series **219** (Oxford, British Archaeological Reports).

Pickard J. 2008 'Shepherding in colonial Australia', *Rural History* **19.1**, 55-80.

Pinter-Bellow S. 2001, 'Animal remains' in Leach P. (ed.), *Fosse Lane, Shepton Mallet 1990: Excavation of a Romano-British Roadside Settlement in Somerset.* Britannia Monograph Series no.**18** (London, Society for the Promotion of Roman Studies) pp.289-303.

Pitts M. 2005, 'Pots and pits: drinking and deposition in late Iron Age south-east Britain', *Oxford Journal of Archaeology* **24**, 143–161.

Pitts M. 2007 'The Emperor's new clothes? The utility of identity in Roman archaeology', *American Journal of Archaeology* **111.4**, 693-713.

Pitts M. and Perring D. 2006, 'The making of Britain's first urban landscapes: The case of late Iron Age and Roman Essex', *Britannia* **37**, 189-212.

Pluskowski A. 2005, 'Narwhals or unicorns? Exotic animals as material culture in medieval Europe', *European Journal of Archaeology* **7.3**, 291-313.

Pluskowski A.G. 2006, 'Where are the wolves? Investigating the scarcity of European Grey Wolf (*Canis lupus lupus*) remains in medieval archaeological contexts and its implications', *International Journal of Osteoarchaeology* **16**, 279–295.

Pluskowski A. G. 2007, 'Who ruled the forests? An inter-disciplinary approach towards medieval hunting landscapes', in Hartmann S. (ed.), *Fauna and Flora in the Middle Ages; Beihefte zur Mediaevistik* (Frankfurt, Peter Lang) pp.291- 323.

Pluskowksi A. G. 2010 'The zooarchaeology of medieval Christendom: ideology, the treatment of animals and the making of medieval Europe', *World Archaeology* **42.2**, 201-214.

Poole K. 2005. Symbolic Scavengers: Corvids in Britain, *c.*500 BC-AD 1500. Unpublished Masters Dissertation, University of Southampton.

Poole K. 2008 'Living and eating in Viking-Age towns and their hinterlands' in Baker S., Allen M., Middle S. and Poole K. (eds.), *Food and Drink in Archaeology 1. University of Nottingham Postgraduate Conference 2007* (Totnes, Prospect Books), pp. 104-112.

Poole K. 2010 'Bird Introductions' in O'Connor T.P. and Sykes N.J. (eds.), *Extinctions and Invasions: The Social History of British Fauna* (Oxford, Oxbow).

Poulton R. 2005, 'Animal bones and shell', pp.76-78 in Poulton R. (ed.), 'Excavations near Broad Street Common, Worplesdon, Guildford', *Surrey Archaeological Collections* **92**, 29-91.

Powell A. and Clark K.M. 1996 Exploitation of domestic animals in the Iron Age at Rooksdown. Unpublished Report for the Centre for Human Ecology Report.

Powell A. and Serjeantson D. 1995, 'Animal bone' in Ratcliffe J. (ed.), 'Duckpool, Morewenstow: A Romano-British and early medieval industrial site and harbour', *Cornish Archaeology* **34**, 81-171.

Powell A., Clark K. and Serjeantson D. 1997, 'The animal bones' in Booth P.M. (ed.), *Asthall, Oxfordshire: Excavations in a Roman 'Small Town', 1992*. Thames Valley Landscapes Monograph No.**9** (Oxford, Oxford Archaeological Unit) pp.141-147.

Powell A., Clark K. and Serjeantson D. n.d. Animal bone from Twyford down. Unpublished Report for the Faunal Remains Unit, Southampton University.

Power G. 1970, 'More about oysters than you wanted to know', *Maryland Law Review* **30**, 199-225.

Prummel W. 1987, 'Atlas for identification of foetal skeletal elements of cattle, horse, sheep and pig', *Archaeozoologica,* volume 1. The Acts of the 5th International Conference of Zooarchaeology. pp.23-78.

Pryor F. 1992, 'Current research at Flag Fen', *Antiquity* **66**, 439-531.

Psikhogios D.K. and Papapetrou G. 1984, 'Oi metakinisis ton nomadon ktinotrofon', *Epitheorisi Koinonikon Erevnon* **53**, 3-23.

Purcell N. 1987, 'Town in country and country in town' in MacDougall E.B. (ed.), *Ancient Roman Villa Gardens* (Washington, Dumbarton Oaks) pp.185-204.

Purcell N. 1990, 'The creation of a provincial landscape: the Roman impact on Cisalpine Gaul' in Blagg T.C.F. and Millett M. (eds.), *The Early Roman Empire in the West* (Oxford, Oxbow) pp.7-29.

Purcell N. 1994, 'The Roman villa and the landscape of production' in Gadza E.K. (ed.), *Roman Art in the Private Sphere: New Perspectives on the Architecture and Décor of the Domus, Villa and Insula* (Ann Arbor, University of Michigan Press) pp.151-179.

Purcell N. 1995, 'Eating fish: the paradoxes of seafood' in Wilking J., Harvey D. and Dobson M. (eds.), *Food in Antiquity* (Exeter, Exeter University Press) pp.132-149.

Purcell N. 1996, 'Rome and the management of water: environment, culture and power', in Salmon J.and Shipley G. (eds.) *Human Landscapes in Classical Antiquity: Environment and Culture* (London, Routledge) pp.180-212.

Rackham D.J. and Gidney L.J. 1984 (minor revisions 2006), 'Piercebridge Roman Fort and Environs: An Analysis of a Sample of Animal Bones from the Collections Excavated at Piercebridge Roman Fort and Vicus. Archaeological Data Service.

Rackham J. 1987, 'Animal Bones' in Heslop D.H. (ed.) *The Excavation of an Iron Age Settlement at Thorpe Thewles, Cleveland, 1980–1982*. CBA Research Report **65** (Cleveland County Council, Council for British Archaeology) pp.99-109.

Rackham O. 1997, *The History of the Countryside: A Classic History of Britain's Landscape, Flora and Fauna* (London, Phoenix).

Reay, M. 1984, 'A high pig culture of the New Guinea Highlands', *Canberra Anthropology* **7**, 71-77.

Redding R.W. and M. Rosenberg 1998, 'Ancestral pigs: A New (Guinea) model for pig domestication in the Middle East', in Nelson S.M. (ed.), *Masca Research Papers in Science and Archaeology* **15** (University of Pennsylvania Museum) pp.65-76.

Redfern R.C., Hamlin C. and Bevan Athfield N. 2010 'Temporal changes in diet: a staple isotope analysis of late Iron Age and Roman Dorset, Britain', *Journal of Archaeological Science* **37**, 1149-1160.

Reece R. 1988, *My Roman Britain* (Cirencester, Private Publication).

Reilly K. 1988, 'The animal bone' in Trow S.D. (ed.) 'Excavation at Ditches Hillfort, North Cerney, Gloucestershire 1982-3', *Transactions of the Bristol and Gloucestershire Archaeological Society* **106**, 19-85 and microfiche.

Reilly K. 1996, 'The bird bones', in Williams R.J., Hart P.J. and Williams A.T.L. (eds.), *Wavendon Gate: A Late Iron Age and Roman Settlement in Milton Keynes, Aylesbury.* Buckinghamshire Archaeology Society Monograph **10** (Aylesbury, Buchinghamshire Archaeological Society) pp.230-233.

Reilly K. 2000, 'Animal bone', pp.146-147 in Parfitt K. (ed.), 'A Roman occupation site at Dickson's Corner, Worth', *Archaeologia Cantiana* **120**, 107-148.

Reilly K. 2005, 'Animal remains' in Yule B. (ed.), *A Prestigious Roman Building Complex on the Southwark Waterfront: Excavations at Winchester Palace, London 1983-90*, Museum of London Archaeology Service Monograph **23** (London, Museum of London Archaeology Service) pp.158-167.

Reilly K. 2010, 'The black rat' in O'Connor T.P and Sykes N.J. (eds.) 2010, *Extinctions and Invasions: The Social History of British Fauna* (Oxford, Oxbow).

Reilly K. and Ainsley C. 2002, 'Animal bone' in Lakin D. (ed.), *The Roman Tower at Shadwell, London: A Reappraisal.* Museum of London Archaeology Service, Archaeology Studies Series **8** (London, Museum of London Archaeology Service) pp.60-63.

Reitz E. and Wing E. 1999, *Zooarchaeology* (Cambridge, Cambridge University Press).

Renfrew A.C. 1972, *The Emergence of Civilisation: The Cyclades and the Aegean in The Third Millennium BC* (London, Methuen Publishing Ltd.).

Reynolds P.J. 1985, *Iron Age Agriculture Reviewed.* Wessex Lecture 1: Council for British Archaeology Group **12** (London, Council for British Archaeology).

Richards M. and Hedges R.E.M. 1999, 'Stable isotope evidence for similarities in the types of marine foods used by late Mesolithic humans at sites along the Atlantic coast of Europe', *Journal of Archaeological Science* **26,** 717-722.

Ritvo H. 1987, *The Animal Estate: The English and Other Creatures in the Victorian Age* (Cambridge, Harvard University Press).

Rixson D. 1984, 'The animal bones - Martin' in Catherall P.D., Barnett M. and McClean H. (eds.), *The Southern Feeder: The Archaeology of a Gas Pipeline* (London, The British Gas Corporation) pp.184-186.

Robbins P. 1998, 'Shrines and butchers: animals as deities, capital and meat in contemporary North India', in Wolch J. and Emel J. (eds.) *Animal Geographies: Place, Politics and Identity in the Nature-Culture Borderlands* (London, Verso) pp. 218-240.

Roberts M.B. and Parfitt S.A. 1999, *Boxgrove. A Middle Pleistocene Hominid Site at Eartham Quarry, Boxgrove, West Sussex.* English Heritage Archaeological Report **17** (London, English Heritage).

Robertshaw P. and Collett D. 1983, 'A new framework for the study of early pastoral communities in East Africa', *The Journal of African History* **24,** 289-301.

Rogers A.C. 2008, 'Religious place and its interaction with urbanization in the Roman era', *Journal of Social Archaeology* **8.1,** 37-62.

Roncaglia N. and Grant A. 2000, 'Animal bones' in Cunliffe B. and Poole C. (eds.), *Woolbury and Stockbridge Down, Stockbridge, Hampshire, 1989. The Danebury Environs Programme: The Prehistory of a Wessex Landscape, volume 2, part 1* (Oxford, Institute of Archaeology) pp.70-72.

Ross A. 1996, *Pagan Celtic Britain* (Chicago, Academy Chicago Publishers).

Rozwadowski A. 2001, 'Sun gods or shamans? Interpreting the "solar-headed" petroglyphs of Central Asia' in Price N. (ed.), *An Archaeology of Shamanism* (London, Routledge), pp.65-86.

Rudkin D.J. 1986, 'The excavation of a Romano-British site by Chichester Harbour, Fishbourne', *Sussex Archaeological Collections* **124**, 51-77.

Rudkin D.J. 1996, 'Excavations at 80 Fishbourne Road, Fishbourne, 1987-8 and a summary of other work carried out in and near the Palace between 1980 and 1989' in Cunliffe B., Down A. and Rudkin D. 1996, *Excavations at Fishbourne 1969-1988*. Chichester Excavations **IX** (Chichester, Chichester District Council) pp.69-89.

Rudling D. (ed.) 2003, *The Archaeology of Sussex to AD2000* (Lewes, The University of Sussex).

Ruscillo D. 2003, 'Alternative methods for identifying sex from archaeological animal bone', in Kotjabopoulou E., Hamilakis Y., Halstead P., Gamble C. and Elephanti V. (eds.), *Zooarchaeology in Greece: Recent Advances* (London, British School at Athens) pp.37-44.

Ruscillo D. 2006, 'The table test: a simple technique for sexing canid humeri', in Ruscillo D. (ed.), *Recent Advances in Ageing and Sexing Animal Bones* (Oxbow Books, Oxford) pp. 119-128.

Russell M. 2006, *Roman Sussex* (Stroud, Tempus).

Ryan J. 1994, 'Visualising imperial geography, Halford Mackinder and the Colonial Office Visual Instruction Committee', *Ecumene* **1.2**, 157-176.

Rye S. 2000, 'Wild pigs, 'pig-men' and transmigrants in the rainforest of Sumatra', in Knight J. (ed.), *People and Wildlife: Conflicts in Anthropological Perspective* (London, Routledge) pp.104-123.

Sadler P. 1997, 'Faunal remains' in Marvell A.G. and Owen-John H.S. (eds.), *Leucarum: Excavations at the Roman Auxilliary Fort at Loughor, West Glamorgan 1982-84 and 1987-88*, Britannia Monograph Series No.**12** (London, Society for the Promotion Roman Studies) pp.396-409.

Sahlins M.D. 1976, *Culture and Practical Reason* (Chicago, University Press).

Said E.W. 2002, 'Invention, memory and place' in Mitchell W.J.T. (ed.), *Landscape and Power* (Chicago, University of Chicago Press) pp. 241-259.

Salway P. 1993, *A History of Roman Britain* (Oxford, Oxford University Press).

Saunders A. 1980, 'The animal bones' in Redknap M. and Millet M. (eds.), 'Excavations on a Romano-British farmstead at Elstead, West Sussex', *Sussex Archaeological Collections* **118**, 221/227-8.

Schein M.D. 1975, 'When is an ethnic group? Ecology and class structure in northern Greece', *Ethnology* **14**, 83-97.

Schlüter W. 1999, 'The Battle of the Teutoburg Forest: Archaeological Research at Kalkriese near Osnabruck', in Creighton J. and Wilson R.G.A. (eds.) *Roman Germany: Studies in Cultural Interaction.* Journal of Roman Archaeology Supplement **32** (Portsmouth, Rhode Island) pp.123-159.

Schmidt E. 1972, *Atlas of Animal Bones for Prehistorians, Archaeologists and Quaternary Geologists* (Amsterdam, Elsevier Publishing).

Schmitt D.N., Madsen D.B. and Lupo K.D. 2002, 'Small-Mammal data on early and middle Holocene climates and biotic communities in the Bonneville Basin, USA', *Quaternary Research.* **58**, 255-260.

Schwabe C. 1994 'Animals in the ancient world' in Manning A. and Serpell J. (eds.), *Animals and Human Society: Changing Perspectives* (London, Routledge) pp.166-187.

Schwyzer P. 1999, 'The scouring of the White Horse: archaeology, identity and heritage', *Representations* **65**, 41-54.

Scott S. 1990, The Animal Bones from Sidbury, Worcester. Unpublished Report Prepared for Herford and Worcester Museums Service [90/23].

Scott S. 1995, 'Symbols of power and nature: the Orpheus mosaics of Roman Britain and their architectural contexts' in Rush P. (ed.) *Theoretical Roman Archaeology: second Conference Proceedings* (Avebury) pp.105-123.

Scott S. 2004, 'Elites, exhibitionism and the society of the late Roman villa' in Christie N. (ed.) *Landscapes of Change: Rural Evolutions in Late Antiquity and the Early Middle Ages* (Aldershot, Ashgate) pp.39-65.

Seetah K. 2005, 'Butchery as a tool for understanding the changing views of animals: cattle in Roman Britain' in Pluskowski A. (ed.), *Just Skin and Bones? New Perspectives on Human-Animal Relations in the Historical Past*, BAR International Series **1410** (Oxford, Archaeopress) pp.1-8.

Seetah K. 2006, 'Multidisciplinary approach to Romano-British cattle butchery' in Maltby M. (ed.), *Integrating Zooarchaeology*. Proceedings of the 9th ICAZ Conference, Durham (Oxford, Oxbow) pp.111-118.

Seetah K. 2008, 'Modern analogy, cultural theory and experimental archaeology' *World Archaeology* **40.1**, 135-150.

Segalen M. 1987 'Life-course patterns and peasant culture in France: a critical assessment', *Journal of Family History* **12.1-3**, 213-224.

Selin H. and Kalland A. (eds.) 2003, *Nature across Cultures: Views of Nature and the Environment in Non-Western Cultures* (London, Kluwer).

Serjeantson D. 1991, 'The bird bones' in Cunliffe B. and Poole C. (eds.), *Danebury: an Iron Age Hillfort in Hampshire, Vol. 5, The Excavations, 1979-88: The Finds.* CBA Research Report **73** (London, Council for British Archaeology) pp.479-481.

Serjeantson D. 1996, 'The animal bones' in Needham S. and Spence A. *Refuse and Disposal at Area 16 East Runnymead; Runnymede Bridge Research Excavations*, vol. II (London, British Museum Press) pp.194-222.

Serjeantson D. 1998, 'Birds: a seasonal resource', *Environmental Archaeology* **3**, 23-33.

Serjeantson D. 2000, 'The bird bones' in Fulford M. and Timby J. (eds.), *Late Iron Age and Roman Silchester: excavations on the site of the Forum-Basilica 1977, 1980-86*. Britannia Monograph Series **15** (London, Society for the Promotion of Roman Studies) pp.484-500.

Serjeantson D. 2006a, 'Animal remains – Haddenham V' in Evans C. and Hodder I. (eds.), *Marshland Communities and Cultural Landscapes from the Bronze Age to Present Day*. The Haddenham Project Volume 2 (Cambridge, McDonald Institute for Archaeological Research) pp.213-248.

Serjeantson D. 2006b, 'Animal remains – Haddenham VI' in Evans C. and Hodder I. (eds.), *Marshland Communities and Cultural Landscapes from the Bronze Age to Present Day*. The Haddenham Project Volume 2 (Cambridge, McDonald Institute for Archaeological Research) pp.288-291.

Serpell J. 1986, *In the Company of Animals. A Study of Human-Animal Relationships* (Oxford, Blackwell).

Sheppard P. 1978, 'Animal remains' in Hartridge R., 'Excavations at the prehistoric and Romano-British site on Slonk Hill, Shoreham, Sussex', *Sussex Archaeological Collections* **116**, 69-142.

Sherkat D.E. and Ellison C.G. 2007, 'Structuring the religion-environment connection: identifying religious influences on environmental concern and activism', *Journal for the Scientific Study of Religion* **46.1**, 71-85.

Sherratt A.G. 1981, 'Plough and pastoralism: aspects of the secondary products revolution', in Hodder I., Isaac G. and Hammond N. (eds.) *Pattern of the Past: Studies in Honour of David Clarke* (Cambridge, Cambridge University Press) pp.261–305.

Shubert A. 1999, *Death and Money in the Afternoon: A History of the Spanish Bullfight* (Oxford, University Press).

Sibun L. 2001, 'The animal bone assemblage', pp.108-109 in Rudling D. (ed.), 'Chanctonbury Ring revisited', *Sussex Archaeological Collections* **139**, 75-122.

Sibun L. 2003, 'Animal bones', in Manley J. and Rudkin D. 2003, *Facing the Palace: Excavations in front of the Roman Palace at Fishbourne.* Sussex Archaeological Collections vol.**141** (Lewes, Sussex Archaeological Society), pp.125-130.

Sillitoe P. 2001, 'Pig men and women, big men and women: gender and production in the New Guinea Highlands', *Ethnology* **40.3**, 171-192.

Sillitoe P. 2007, 'Pigs in the New Guinea highlands: an ethnographic example' in Albarella U., Dobney K., Ervynck A. and Rowley-Conwy P. (eds), *Pigs and Humans: 10,000 Years of Interaction* (Oxford, Oxford University Press).

Silvasti T. 2003, 'The cultural model of 'the good farmer' and the environmental question in Finland', *Agriculture and Human Values* **20**, 143-150.

Silver I.A. 1970, 'The ageing of domestic animals' in Brothwell D.R. and Higgs E.S. (eds.), *Science in Archaeology: A Survey of Progress and Research.* Second edition (New York, Praeger) pp.283-302.

Simpson G.G., Roe A. and Lewontin R.C. 1960, *Quantitative Zoology* (New York, Harcourt Brace and Co.).

Smith K. 2006, *Guides, Guards and Gifts to the Gods: Domesticated Dogs in the Art and Archaeology of Iron Age and Roman Britain.* BAR British Series **422** (Oxford, British Archaeological Report).

Smith P. 1993, Appendix 2: Fish Remains from Birdoswald, in Izard K. (ed.), The animal bones from Birdoswald CAS site 420, Cumbria 1986-90. English Heritage Ancient Monuments Laboratory Report, 13/93.

Smith J.T. 1997, *Roman Villas: A Study in Social Structure* (London, Routledge).

Smith P. and Serjeantson D. 2008, 'Animal bone' in Fitzpatrick A.P., Powell A.B. and Allen M.J., *Archaeological Excavations on the route of the A27 Westhampnett Bypass, West Sussex, 1992.* Volume 1: Late Upper Palaeolithic – Anglo-Saxon, pp.220-225.

Somerville L. and J. Bonell 2006, 'The marine shell' pp.94-97, in Manley J. and Rudkin D. 'More buildings facing the Palace', *Sussex Archaeological Collections* **144**, 69-113.

Sproul B. 1991, *Primal Myths: Creation Myths around the World* (San Francisco, Harper).

Stallibrass S. 1982 'The faunal remains', in Potter T. and Potter C. (eds), *A Romano-British Village at Grandford, March, Cambridgeshire*. British Museum Occasional Paper **35**, 98–12.

Stallibrass S. 1996, 'Animal bones' in Jackson R.P.J. and Potter T.W. (eds.), *Excavations at Stonea, Cambridgeshire 1980-85* (London, British Museum Press) pp.587-603.

Stallibrass S. 2000, 'Cattle, culture, status and soldiers in northern England' in Fincham G., Harrison G., Holland R. and Revell L. (eds.), *TRAC: Proceedings of the Ninth Annual Theoretical Roman Archaeology Conference, Durham 1999* (Oxford, Oxbow Books) pp.64-73.

Stallibrass S. 2002, 'An overview of the animal bones: what would we like to know, what do we know so far, and where do we go from here?' in Wilson P.R. (ed), *Catteractonium: Roman Catterick and its hinterland. Excavations and research 1958-1997. Part II.* CBA Research Report **129** (York, English Heritage and Council for British Archaeology) pp.392-438.

Stallibrass S. and Nicholson R. 2000, 'Animal and fish bone' in Buxton K. and Howard-Davis C. (eds.), *Bremetenacum: Excavations at Roman Ribchester 1980, 1989-1990* (Lancaster, Lancaster University Archaeological Unit) pp.375-386.

Starr R.J. 1992, 'Silvia's Deer (Vergil, Aeneid 7.479-502): game parks and Roman law', *The American Journal of Philology* **113.3**, 435-439.

Startin J. 1981, 'Animal bones', p.42 in Startin D.W.A. (ed.), 'Excavations at South Grove Cottage, Dorchester', Dorset *Natural History and Archaeological Society Proceedings* **103**, 21-42.

Staski E. 1987, 'Border city, border culture: assimilation and change in late 19th century El Paso', in A. Staski (ed.) *Living in Cities: Current Research in Historical Archaeology* (Pleasant Hill, Society for Historical Archaeology) pp.48-55.

Stead I.M. 1980, *Rudston Roman Villa* (Leeds, Yorkshire Archaeological Society).

Stopford J. 1987, 'Danebury: an alternative view', *Scottish Archaeological Review* **4**, 70-75.

Strid L. 2009, 'Animal bone', pp.58-59 in Brown L., Stansbie D. and Webley L. (eds.), An Iron Age settlement and post-Medieval farmstead at Oxley Park West', *Records of Buckinghamshire* **49**, 43-72.

Studer J. and Pillonel D. 2007, 'Traditional pig butchery by the Yali people of West Papua (Irian Jaya): an ethnographic and archaeozoological example', in Albarella U., Dobney K., Ervynck A. and Rowley-Conwy P. (eds), *Pigs and Humans: 10,000 years of interaction* (Oxford, Oxford University Press) pp. 320-335.

Sykes N.J. 2002, 'Animal remains' in Valentin J. (ed.), 'Manor Farm, Portesham, Dorset: excavations on a multi-period religious and settlement site', *Proceedings of the Dorset Natural History and Archaeological Society* **125**, 23-69.

Sykes N.J. 2004, 'The introduction of fallow deer (*Dama dama*): A zooarchaeological perspective', *Environmental Archaeology* **9**, 75-83.

Sykes N.J. 2005a, 'Animal bones' pp.78-86, in Manley J. and Rudkin D., 'A Pre-AD43 ditch at Fishbourne Roman Palace, Chichester', *Britannia* **36**, 55-100.

Sykes N.J. 2005b, 'Hunting for the Anglo-Normans: zooarchaeological evidence for medieval identity', in Pluskowski A. (ed.), *Just Skin and Bones? New Perspectives on Human-Animal Relations in the Historical Past*, BAR International Series **1410** (Oxford, British Archaeological Report) pp.71-78.

Sykes N.J. 2005c, 'The dynamics of status symbols: wildfowl exploitation in medieval England', *Archaeological Journal* **161**, 82-105.

Sykes N.J. 2006, 'The impact of the Normans on hunting practices in England' in Woolgar C., Serjeantson D. and Waldron T. (eds.), *Food in Medieval England: Diet and Nutrition* (Oxford, Oxford University Press) pp. 162-175.

Sykes N.J. 2007a, 'Animal bone' in Miles D., Palmer S., Smith A. and Perpetua Jones P. (eds.), *Iron Age and Roman Settlement in the Upper Thames Valley, Excavations at Claydon Pike and other Sites within the Cotswold Water Park.* Thames Valley Landscapes

Monograph **26** (Oxford, Oxford University School of Archaeology) pp.53-54/84-85/151-153.

Sykes N.J. 2007b, 'Animal bones and animal parks' in R. Liddiard (ed.), *New Perspectives on Medieval Parks* (Macclesfield, Windgather Press) pp.49-62.

Sykes, N.J. 2007c, *The Norman Conquest: A Zooarchaeological Perspective*, BAR International Series **1656** (Oxford, British Archaeological Reports).

Sykes N. J. 2009, 'Animals, the bones of medieval society' in Gilchrist R.and Reynolds A. (eds.), *Reflections: 50 years of Medieval Archaeology 1957-2007.* Society for Medieval Archaeology Monograph **30** (Leeds, Maney: Society for Medieval Archaeology) pp.347-361.

Sykes N.J. 2010, 'Fallow deer' in O'Connor T.P. and Sykes N.J. (eds.), *Extinctions and Invasions: A Social History of British Fauna* (Oxford, Windgather) pp.51-58.

Sykes N.J. in prep. 'Mirrors and windows, or through the looking glass?' (Southampton University Publication).

Sykes N.J. and Curl J. 2010, 'The rabbit' in O'Connor T.P. and Sykes N.J. (eds.), *Extinctions and Invasions: A Social History of British Fauna* (Oxford, Windgather) pp.116-126.

Sykes N.J. and Symmons R. 2007, 'Sexing cattle horn-cores: problems and progress', *International Journal of Osteoarchaeology*, **17**, 514-523.

Sykes N.J., White J., Hayes T. and Palmer M. 2006a, 'Tracking animals using strontium isotopes in teeth: the role of fallow deer (*Dama dama*) in Roman Britain', *Antiquity* **80.310**, 948-959.

Sykes N.J., Ingrem C. and White J. 2006b, 'Animal remains from the 2002 excavations at Fishbourne, Sussex', in Manley J. and Rudkin D. (eds.), 'More buildings facing the Palace', *Sussex Archaeological Collections* **144**, 69-113.

Sykes N.J., Baker K., Hoelzel R., Massetti M. and Vernasi C. 2010, 'New evidence for the establishment and management of the European fallow deer (*Dama dama dama*) in Roman Britain', *Journal of Archaeological Science* **37**, online.

Symons M. 2002, 'Cutting up cultures', *Journal of Historical Sociology* **15.4**, 431-450.

Taylor J. 2007, *An Atlas of Roman Rural Settlement in England.* CBA Research Report **151** (London, Council for British Archaeology).

Terrenato N. 2007, 'The essential countryside: Roman' in Alcock S.E. and Osborne R. (eds.), *Classical Archaeology* (Oxford, Blackwell) pp.139-161.

Tester K. 1991, *Animals and Society: The Humanity of Human Rights* (London, Routledge).

Thawley C. 1982, 'The animal remains' in Wacher J. and McWhirr A. (eds.), *Early Roman Occupation at Cirencester.* Cirencester Excavation Report **1** (Cirencester, Cirencester Excavation Committee) pp.211-217.

Thomas J. 1996, *Time, Culture and Identity: An Interpretive Archaeology* (London, Routledge).

Thomas K. 1983, *Man and the Natural World: Changing Attitudes in England 1500-1800* (London, Allen Lane).

Thomas R. 2006. 'Of books and bones: the integration of historical and zooarchaeological evidence in the study of medieval animal husbandry' in Maltby M. (ed.), *Integrating Zooarchaeology.* Proceedings of the 9th ICAZ Conference, Durham (Oxford, Oxbow) pp.17-26.

Thomas R. 2008, 'Supply-chain networks and the Roman invasion of Britain: A case study from Alchester, Oxfordshire' in Stallibrass S. and Thomas R. (eds.), *Feeding the Roman Army: The Archaeology of Production and Supply in NW Europe* (Oxford, Oxbow) pp.31-51.

Thomas R. and Wilson A. 1994, 'Water supply for Roman farms in Latium and South Etruria' *Papers of the British School at Rome* **62**, 139-196.

Thomas R. and Stallibrass S. 2008, 'For starters: producing and supplying food to the army in the north-west provinces' in Stallibrass S. and Thomas R. (eds.), *Feeding the Roman Army: The Archaeology of Production and Supply in NW Europe* (Oxford, Oxbow) pp.1-17.

Thompson P.B. 1995, *The Spirit of the Soil: Agriculture and Environmental Ethics* (London, Routledge).

Tilley C. 1994, *A Phenomenology of Landscape: Places, Paths and Monuments* (Oxford, Berg).

Toohey P. 1996, *Epic lessons: An Introduction to Ancient Didactic Poetry* (London, Routledge).

Toynbee J.M.C. 1973, *Animals in Roman Life and Art* (London, Thames and Hudson).

Tuck S. 2005, 'The origins of imperial hunting imagery: Domitian and the redefinition of *Virtus* under the Principate', *Greece & Rome* **52.2**, 221-245.

Van der Noort R. and O'Sullivan A. 2007, 'Places, perceptions, boundaries and tasks: rethinking landscapes' in Barber J. and Sheridan A. (eds). *Archaeology from the Wetlands: Recent Perspectives.* Proceedings of the 11th WARP conference, Edinburgh 2005 (Edinburgh, Society of Antiquaries of Scotland) pp.79-89.

Veen M. van der 1992, *Crop Husbandry Regimes: An Archaeobotanical Study of Farming in Northern England: 1000 BC - AD 500.* Sheffield Archaeological Monographs 3 (Sheffield, Sheffield Archaeological Reports).

Van der Veen M. and O'Connor T.P. 1998, 'The expansion of agricultural in later Iron Age and Roman Britain' in Bayley J. (ed.), *Science in Archaeology: An Agenda for the Future* (London, English Heritage) pp.127-143.

Van der Veen M. (ed.) 2005. *Garden Agriculture. World Archaeology* **37.2,** 157-163.

Van der Veen M. 2008. 'Food as embodied material culture – diversity and change in plant food consumption in Roman Britain', *Journal of Roman Archaeology* **21,** 83-110.

Van Wieren S.E. 1991, 'The management of populations of large mammals' in Spellerberg I.F., Goldsmith F.B. and Morris M.G. (eds.). *The Scientific Management of Temperate Communities for Conservation* (Oxford, Blackwell) pp.103-127.

Vivenza G. 1998, 'Roman thought on economics and justice', in Todd Lowry S. and Gordon B.L.J. (eds.), *Ancient and Medieval Economic Ideas and Concepts of Social Justice* (Leiden, Koninklijke Brill) pp.269-332.

Von den Driesch A. 1976. *A Guide to the Measurement of Animal Bones from Archaeological Sites.* Peabody Museum Bulletin **1** (Harvard University, Peabody Museum of Archaeology and Ethnology).

Walker L., 1984 'The deposition of human remains' in Cunliffe B. 1984, *Danebury: an Iron Age Hillfort in Hampshire. Vol.II: The Excavations, 1969-1978: The Finds.* CBA Research Report **52** (London, Council for British Archaeology) pp.442-463.

Warman S. 2000, Morphometric Investigation of Dental Variation to Examine Genetic Relationships between Pig Populations'. Unpublished PhD thesis, University College London.

Webster G. 1985, 'The bird bones', pp.96-97 in Webster G., Fowler P., Noddle B. and Smith L. (eds.), 'The excavation of a Romano-British rural establishment at Barnsley Park, Gloucestershire 1961-79: part III', *Transactions of the Bristol and Gloucestershire Archaeological Society* **103**, 73-100.

Webster J. 1996, 'Roman imperialism and the post-imperial age' in Webster J. and Cooper N. (eds.), *Roman Imperialism: Post-Colonial Perspectives.* Leicester Archaeology Monographs **1** (Leicester, Leicester University Press).

Webster J. 2001, 'Creolising Roman Britain', *American Journal of Archaeology* **105.2**, 209-225.

Weiss-Krejci, E. 2001, 'Restless corpses: "secondary burial" in the Babenberg and Habsburg dynasties', *Antiquity* **75**, 769-80.

Weiss-Krejci, E. 2005, 'Excarnation, evisceration, and exhumation in medieval and post-medieval Europe' in Rakita G., Buikstra J., Beck L. and Williams S. (eds.), *Interacting with the Dead: Perspectives on Mortuary Archaeology for the New Millennium* (Gainesville, University Press of Florida) pp.155-72.

Welch K. 1994 'The Roman arena in late Republican Italy: A new interpretation', *Journal of Roman Archaeology* **7**, 59-80.

West B. 1983, The Roman Buildings west of the Walbrook Project: Human, Animal and Bird Bones. Level III. Unpublished Manuscript, Department of Urban Archaeology, Museum of London.

Westley B. 1969, 'The animal bones from Coygan' in Wainwright G.W. (ed.), *Coygan Camp: A Prehistoric Romano-British and Dark Age Settlement in Carmarthenshire* (Cardiff, Cambrian Archaeological Association) pp.190-194.

Whatmore S. 2002, *Hybrid Geographies: Natures, Cultures, Spaces* (London, Sage).

Whatmore S. and Thorne L. 1998, 'Wild(er)ness: reconfiguring the geographies of wildlife', *Transactions of the Institute of British Geographers* **23.4**, 435-454.

Whatrup C. and Jones R.T. 1988, 'Animal bones', microfiche in Jackson D.A. and Dix B., 'Late Iron Age and Roman settlement at Weekley, Northants', *Northamptonshire Archaeology* **21**, 41-93.

Wheeler A. 1932, 'Bones' in Wheeler, R.E.M. (ed.), *Report on the Excavation of the Prehistoric, Roman and Post-Roman Site in Lydney Park, Gloucestershire* (Oxford).

Wheeler A. 1969, *The Fishes of the British Isles and North-West Europe* (London, Macmillan).

Wheeler A. 1974, 'Fish remains' in Thomas D. (ed.), *Excavations at Billingsgate Buildings, Lower Thames Street, London.* London and Middlesex Archaeological Society Special Paper **4** (London, London and Middlesex Archaeological Society) pp.161-162.

Wheeler A. 1981, 'Fish bones' in Partridge C. (ed.), *Skeleton Green: A Late Iron Age and Roman-British Site.* Britannia Monograph Series **2** (London, Society for the Promotion of Roman Studies) pp.242-243.

Whimster R. 1981, *Burial Practices in Iron Age Britain.* BAR British Series **90** (Oxford, British Archaeological Reports).

White D.A. 1964. 'Excavations at War Ditches, Cherry Hinton', *Proceedings of the Cambridge Antiquity Society* **56**, 9-29.

White J. n.d. The Animal bones from Fishbourne. Unpublished Masters dissertation, University of Southampton.

White K.D. 1970, *Roman Farming* (London, Thames and Hudson).

Whitehead K. G. 1972. *Deer of the World* (London, Constable).

Wickham C. 1994, *Land and Power; Studies in Italian and European Social History, 400-1200* (London, British School at Rome).

Wilkie R. and Inglis D. (eds.) 2007, *Animals and Society: Critical Concepts in the Social Sciences* (Abingdon, Routledge).

Wilkinson M. 1979, 'The fish remains' in Maltby M., *The Animal Bones from Exeter 1971–75.* Exeter Archaeological Reports **2** (Sheffield, Department of Archaeology and Prehistory) pp.74-81.

Willerslev R. 2004, 'Not animal, not not-animal: hunting, imitation and empathetic knowledge among Siberian Yukaghirs', *Journal of the Royal Anthropological Institute* **10.3**, 629-652.

Willerslev R. 2007, *Soul Hunters: Hunting, Animism, and Personhood among the Siberian Yukaghirs* (Berkeley, University of California Press).

Williams H. 2001, 'An ideology of transformation: cremation rites and animal sacrifice in early Anglo-Saxon England' in Price N. (ed.), *An Archaeology of Shamanism* (London, Routledge) pp.193-212.

Williams R.J and Zeepvat R.J. 1994, *Bancroft, A Late Bronze Age/Iron Age Settlement, Roman Villa and Temple Mausoleum.* Buckinghamshire Archaeological Society Monograph **7** (Milton Keynes, Buckinghamshire Archaeological Society).

Willis S. 2007. Sea, coast, estuary, land and culture in Iron Age Britain, in Haselgrove C. and Moore T. (eds.), *The Later Iron Age in Britain and Beyond.* (Oxford, Oxbow Books) pp.107-129.

Wilson B. 1979, 'The vertebrates' in Lambrick G. and Robinson M. (eds.), *Iron Age and Roman Riverside Settlements at Farmoor, Oxfordshire.* CBA Research Report **32** (London, Council for British Archaeology) pp.128-133.

Wilson B. 1980, 'Animal bone', pp.84-89 in Hinchliffe J. and Thomas R. (eds.), 'Archaeological Excavations at Appleford', *Oxoniensia* **XLV**, 9-111.

Wilson B. 1986, 'Faunal remains: animals and marine shells' in Miles D. (ed.), *Archaeology at Barton Court Farm, Abingdon, Oxon: An Investigation of Late Neolithic, Iron Age, Romano-British and Saxon Settlements.* CBA Research Report **50** (London, Council for Britsh Archaeology) microfiche ch.VI.

Wilson B. 1993, 'Reports on the bone and oyster shell' in Allen T.G. and Robinson M.A. (eds.), *The Prehistoric Landscape and Iron Age Enclosed Settlement at Mingies Ditch, Hardwick-with-Yelford, Oxon, Thames Valley Landscapes: The Windrush Valley, vol.II* (Oxford, Oxford University Committee for Archaeology) pp.123-145, 168-204 and 237-249.

Wilson B. 1996, *Spatial Patterning among Animal Bones in Settlement Archaeology.* BAR British Series **251** (Oxford, British Archaeological Reports).

Wilson B. and Allison E. 1990, 'The animal and fish bones' in Allen T.G. (ed.), *An Iron Age and Romano-British Enclosed Settlement at Watkins Farm Northmoor, Oxon. Thames Valley Landscapes: The Windrush Valley, Volume 1* (Oxford, Oxford University Committee for Archaeology) pp.57-61.

Wilson B., Grigson C. and Payne S. (eds.) 1982, *Ageing and Sexing Animal Bones from Archaeological Sites.* BAR British Series **109** (Oxford, British Archaeological Report) pp.91-108.

Witcher R. 1998, 'Roman roads: phenomenological perspectives on roads in the landscape' in Forcey C., Hawthorne J. and Witcher R. (eds.), *TRAC97, Proceedings of the Seventh Annual Theoretical Roman Archaeology Conference* (Oxford, Oxbow Books) pp.60-70.

Wolch J. and Emel J. (eds.) 1998, *Animal Geographies: Place, Politics and Identity in the Nature-Culture Borderlands* (London, Verso).

Woodward A. 1992, *Shrines and Sacrifice* (London, Batsford).

Woodward A. and Leach P. 1993, *The Uley Shrines: Excavations of a Ritual Complex on West Hill, Uley, Gloucestershire, 1977-79.* English Heritage Archaeological Report **17** (London, English Heritage).

Woodward P. and Woodward A. 2004, 'Dedicating the town: urban foundation deposits in Roman Britain', *World Archaeology* **36**, 68-86.

Woolf G. 1998, *Becoming Roman: The Origins of Provincial Civilization in Gaul* (Cambridge, Cambridge University Press).

Wylie J. 2007, *Landscape* (London, Routledge).

Yalden D. 1999, *The History of British Mammals* (London, Poyser).

Yalden D.W 2002, 'Place-name and archaeological evidence on the recent history of birds in Britain', *Acta zoologica cracoviensia* **45**, 415-429.

Yarwood R. and Evans N. 2000, 'Taking stock of farm animals and rurality' in Philo C. and Wilbert C. (eds.), *Animal Spaces, Beastly Places: New Geographies of Human-Animal* Relations (London, Routledge) pp.98-114.

Zeepvat R.J. 1991, 'Roman gardens in Britain' in Brown A.E. (ed.), *Garden Archaeology.* CBA Research Report **78** (London, Council for British Archaeology) pp.53-59.

Zienkiewicz J.D. 1986 (ed.), *The Legionary Fortress Baths at Caerleon, vol.II: the finds* (Gloucester, Alan Sutton).

Zienkiewicz J.D., Hillam J., Besly E., Dickinson B.M., Webster P.V., Fox S.A., Hamilton-Dyer S., Caseldine A.E., Busby P.A. (ed.) 1993, 'Excavations in the *Scamnum Tribunorum* at Caerleon: The Legionary Museum Site 1983-5', *Britannia* **24**, 27-140.

Classical Sources

Arrian, *Arrian on Coursing: the Cynegeticus of the Younger Xenophon,* trans. Bohn J. 1831 (London).

Caesar, *The Gallic War,* trans. Hammond C. 1996 (Oxford, Oxford World's Classics).

Cato and Varro, *De Re Rustica*, trans. Hooper W.D. 1934 (London, Heinemann).

Cicero, *On Moral Ends (On Offices),* trans. Woolf R. 2001 (Cambridge, University Press).

Collumella, *De Re Rustica,* trans. Forster E.S. and Heffner E.H. 1955 (London, Heinemann).

Dio Cassius, *Roman History,* trans. Carey E. 1961 (London, Heinemann).

Grattius, *A Poem of Hunting* (*Grati Falisci Cynegeticon),* trans. Wase Gent C. 1654 (Fleet Street, London, Charles Adams).

Iamblichus, *On the Pythagorean Way of Life,* trans. Dillon J. and Hershbell J. 1991 (Atlanta, Scholars Press).

Lucretius, *On the Nature of Things (De Rerum Natura),* trans. Rouse W.H.D. 1982 (London, Heinemann).

Pliny, *Natural History,* trans. Rackham H. 1940 (London, Heinemann).

Strabo, *Geography,* trans. Falconer W. 1903 (London).

Suetonius, *The Lives of the Caesars – Domitian*, trans. Rolfe J.C. 1959 (London, Heinemann).

Tacitus, *The Annals,* trans. Moore C.H. and Jackson J. 1962 (London, Heinemann).

Virgil, *Georgics,* trans. Fairclough H.R. 1999 (London, Heinemann).

Appendix A – Macro-scale data

Appendix A.I; Cattle, caprine and pig NISP and relative frequencies by site type and date

Site	Cattle		Sheep/Goat		Pig		TOTAL
	NISP	%	NISP	%	NISP	%	NISP
Middle Iron Age: Rural - minor (n=32)							
Appleford	198	**58.2**	99	**29.1**	43	**12.6**	**340**
Ashville Trading Estate	366	**30.4**	727	**60.3**	112	**9.3**	**1205**
Aston Mill Farm	279	**44.4**	276	**43.9**	74	**11.8**	**629**
Biddenham Loop	180	**43.9**	144	**35.1**	86	**21.0**	**410**
Blackhorse Road	294	**70.2**	104	**24.8**	21	**5.0**	**419**
Bramdean	277	**31.4**	498	**56.5**	107	**12.1**	**882**
Brighton Hill	134	**28.0**	292	**61.1**	52	**10.9**	**478**
Carne's Seat	23	**42.6**	10	**18.5**	21	**38.9**	**54**
Chilbolton Down	113	**31.7**	229	**64.1**	15	**4.2**	**357**
Claydon Pike, Warrens Field	330	**51.3**	279	**43.4**	34	**5.3**	**643**
Dolland's Moor	214	**51.8**	149	**36.1**	50	**12.1**	**413**
Easton Lane	72	**28.7**	160	**63.7**	19	**7.6**	**251**
Eldon's Seat	140	**29.4**	305	**64.1**	31	**6.5**	**476**
Farleigh Wallop	134	**28.0**	292	**61.1**	52	**10.9**	**478**
Farmoor	70	**52.2**	51	**38.1**	13	**9.7**	**134**
Gravelly Guy	2910	**37.1**	4260	**54.4**	667	**8.5**	**7837**
Groundwell Farm	556	**14.9**	1882	**50.5**	1292	**34.6**	**3730**
Hawk's Hill	234	**18.8**	738	**59.2**	274	**22.0**	**1246**
Houghton Down (Hamilton)	779	**27.6**	1792	**63.6**	248	**8.8**	**2819**
Kingsmead South	167	**39.8**	244	**58.1**	9	**2.1**	**420**
Market Deeping	138	**44.4**	151	**48.6**	22	**7.1**	**311**
Micheldever Wood	836	**36.2**	1147	**49.7**	326	**14.1**	**2309**
Old Down Farm	401	**26.2**	1046	**68.3**	85	**5.5**	**1532**
Owslebury	886	**40.3**	1004	**45.6**	310	**14.1**	**2200**
Rooksdown	324	**26.2**	653	**52.8**	259	**21.0**	**1236**
Slonk Hill	144	**33.8**	208	**48.8**	74	**17.4**	**426**
Spratsgate Lane	322	**49.5**	272	**41.8**	56	**8.6**	**650**
Suddern Farm	1267	**29.0**	2961	**67.7**	148	**3.4**	**4376**
Thorpes Thewles	747	**62.3**	323	**26.9**	130	**10.8**	**1200**
Weekley	281	**13.4**	1327	**63.5**	482	**23.1**	**2090**
Winnall Down	838	**34.9**	1307	**54.4**	259	**10.8**	**2404**
Woolbury	25	**25.0**	64	**64.0**	11	**11.0**	**100**
Sum of Percentages		**1181.5**		**1617.7**		**400.8**	**42055**
Mean Percentage		**36.9**		**50.6**		**12.5**	
Middle Iron Age: Rural -nucleated (n=8)							
Bury Hill	153	**31.4**	317	**65.0**	18	**3.7**	**488**
Bury Wood Camp	124	**30.8**	235	**58.3**	44	**10.9**	**403**
Conderton Camp	758	**20.1**	2165	**57.4**	848	**22.5**	**3771**
Danebury	7068	**21.7**	21283	**65.3**	4230	**13.0**	**32581**
Dragonby	527	**29.1**	1029	**56.8**	255	**14.1**	**1811**
Maiden Castle	908	**21.0**	3009	**69.6**	405	**9.4**	**4322**
Uley Bury	131	**29.9**	181	**41.3**	126	**28.8**	**438**
Winklebury Camp	759	**26.9**	1802	**63.8**	263	**9.3**	**2824**
Sum of Percentages		**210.8**		**477.6**		**111.6**	**124918**
Mean Percentage		**26.4**		**59.7**		**14.0**	

Site	Cattle		Sheep/Goat		Pig		TOTAL
	NISP	%	NISP	%	NISP	%	NISP
Late Iron Age: Rural - minor (n=56)							
Abbeymead	49	**30.4**	105	**65.2**	7	**4.3**	**161**
Ashville Trading Estate	290	**40.8**	334	**47.0**	86	**12.1**	**710**
Balksbury Camp	1490	**30.4**	2606	**53.1**	810	**16.5**	**4906**
Barton Court Farm	443	**46.6**	415	**43.6**	93	**9.8**	**951**
Bicester Fields Farm	361	**59.8**	206	**34.1**	37	**6.1**	**604**
Biddenham Loop	54	**32.1**	67	**39.9**	47	**28.0**	**168**
Billingborough	964	**52.9**	757	**41.5**	102	**5.6**	**1823**
Birdlip	149	**66.8**	71	**31.8**	3	**1.3**	**223**
Bishopstone	304	**48.3**	247	**39.3**	78	**12.4**	**629**
Blackthorn	68	**45.9**	74	**50.0**	6	**4.1**	**148**
Brighton Hill	159	**28.6**	338	**60.9**	58	**10.5**	**555**
Chignall	164	**88.6**	17	**9.2**	4	**2.2**	**185**
Clay Lane	642	**52.5**	516	**42.2**	64	**5.2**	**1222**
Coppice Corner	102	**39.8**	138	**53.9**	16	**6.3**	**256**
Copse Farm	241	**47.0**	195	**38.0**	77	**15.0**	**513**
Dalton Parlours	166	**23.9**	495	**71.2**	34	**4.9**	**695**
Dolland's Moor	237	**55.4**	149	**34.8**	42	**9.8**	**428**
Easton Lane	45	**43.7**	50	**48.5**	8	**7.8**	**103**
Edix Hill	177	**28.7**	337	**54.7**	102	**16.6**	**616**
Farleigh Wallop	159	**28.8**	336	**60.8**	58	**10.5**	**553**
Farningham Hill	221	**55.7**	148	**37.3**	28	**7.1**	**397**
Fishbourne, ditch (1995-2002)	24	**8.9**	49	**18.1**	197	**73.0**	**270**
Flagstones	471	**31.7**	954	**64.2**	60	**4.0**	**1485**
Frocester	630	**59.0**	364	**34.1**	73	**6.8**	**1067**
Gorhambury	81	**50.0**	39	**24.1**	42	**25.9**	**162**
Grateley South	202	**29.1**	445	**64.0**	48	**6.9**	**695**
Haddenham V	837	**24.3**	2446	**71.1**	155	**4.5**	**3438**
Haddenham VI	86	**23.5**	232	**63.4**	48	**13.1**	**366**
Hallen	797	**40.9**	1078	**55.4**	72	**3.7**	**1947**
Houghton Down (Hammon)	132	**41.9**	153	**48.6**	30	**9.5**	**315**
Little Oakley	78	**52.3**	61	**40.9**	10	**6.7**	**149**
Little Somborne	268	**47.1**	256	**45.0**	45	**7.9**	**569**
Mingies Ditch	521	**33.9**	914	**59.4**	103	**6.7**	**1538**
Moulton Park	364	**57.3**	192	**30.2**	79	**12.4**	**635**
Nettlebank Copse	938	**33.7**	1360	**48.8**	489	**17.5**	**2787**
North Bersted	259	**48.4**	203	**37.9**	73	**13.6**	**535**
North Shoebury	33	**27.0**	67	**54.9**	22	**18.0**	**122**
Orton Longueville	348	**45.3**	338	**44.0**	82	**10.7**	**768**
Owslebury	1361	**24.8**	2688	**49.0**	1434	**26.2**	**5483**
Oxley Park West	104	**56.5**	67	**36.4**	13	**7.1**	**184**
Rucstalls	233	**31.0**	470	**62.6**	48	**6.4**	**751**
Runfold	420	**62.9**	201	**30.1**	47	**7.0**	**668**
Slonk Hill	54	**24.5**	146	**66.4**	20	**9.1**	**220**
Suddern Farm	690	**46.2**	711	**47.6**	93	**6.2**	**1494**
Thorpe Lea	96	**52.2**	61	**33.2**	27	**14.7**	**184**
Thorpes Thewles	841	**55.3**	411	**27.0**	268	**17.6**	**1520**
Thruxton	53	**45.7**	49	**42.2**	14	**12.1**	**116**
Tolpuddle Ball	110	**34.3**	191	**59.5**	20	**6.2**	**321**
Tort Hill West	64	**50.8**	48	**38.1**	14	**11.1**	**126**
Travelegue	192	**57.3**	96	**28.7**	47	**14.0**	**335**
Wardy Hill	371	**29.4**	708	**56.1**	183	**14.5**	**1262**
Watkins Farm	405	**44.0**	429	**46.6**	87	**9.4**	**921**
Wavendon Gate	413	**82.1**	79	**15.7**	11	**2.2**	**503**
Weekley	1424	**45.9**	1266	**40.8**	413	**13.3**	**3103**
West Stow	1390	**54.5**	890	**34.9**	270	**10.6**	**2550**
Worth Maltravers, Compact Farm	453	**21.3**	1573	**73.8**	105	**4.9**	**2131**

Site	Cattle		Sheep/Goat		Pig		TOTAL
	NISP	%	NISP	%	NISP	%	NISP
Late Iron Age: Rural - minor (n=56) continued							
Sum of Percentages		**2420.0**		**2550.2**		**629.8**	**54566**
Mean Percentage		**43.2**		**45.5**		**11.2**	
Late Iron Age: Rural - nucleated (n=9)							
Baldock	39	**52.0**	22	**29.3**	14	**18.7**	**75**
Cadbury Congresbury	604	**55.1**	134	**12.2**	358	**32.7**	**1096**
Coygan Camp	381	**65.8**	101	**17.4**	97	**16.8**	**579**
Danebury	417	**34.2**	716	**58.6**	88	**7.2**	**1221**
Dragonby	2273	**29.4**	4423	**57.3**	1027	**13.3**	**7723**
Grimthorpe	403	**62.6**	184	**28.6**	57	**8.9**	**644**
Silchester	1454	**45.5**	820	**25.7**	922	**28.8**	**3196**
Sutton Walls	863	**43.8**	752	**38.2**	355	**18.0**	**1970**
Uley Bury	175	**40.3**	215	**49.5**	44	**10.1**	**434**
Sum of Percentages		**428.7**		**316.9**		**154.4**	**16938**
Mean Percentage		**47.6**		**35.2**		**17.2**	
Late Iron Age: Religious (n=4)							
Bancroft, temple-mausoleum	503	**55.7**	317	**35.1**	83	**9.2**	**903**
Haddenham IV	65	**53.3**	53	**43.4**	4	**3.3**	**122**
Uley Shrines	217	**27.6**	554	**70.6**	14	**1.8**	**785**
Witham	899	**59.1**	467	**30.7**	155	**10.2**	**1521**
Sum of Percentages		**195.7**		**179.8**		**24.4**	**3331**
Mean Percentage		**48.9**		**45.0**		**6.1**	
IA/RB transition: Rural - minor (n=36)							
Burgh	585	**40.1**	697	**47.7**	178	**12.2**	**1460**
Twyford Down	43	**16.6**	203	**78.4**	13	**5.0**	**259**
Winnall Down	69	**44.8**	70	**45.5**	15	**9.7**	**154**
Woolbury	69	**39.0**	99	**55.9**	9	**5.1**	**177**
Lavant	75	**51.0**	55	**37.4**	17	**11.6**	**147**
Fishbourne, Westward House	81	**36.3**	61	**27.4**	81	**36.3**	**223**
Martin	82	**79.6**	18	**17.5**	3	**2.9**	**103**
Carne's Seat	85	**36.3**	117	**50.0**	32	**13.7**	**234**
Balksbury Camp	98	**21.2**	211	**45.6**	154	**33.3**	**463**
Rooksdown	112	**30.4**	224	**60.9**	32	**8.7**	**368**
Ounces Barn	114	**75.0**	27	**17.8**	11	**7.2**	**152**
Easton Lane	120	**59.4**	68	**33.7**	14	**6.9**	**202**
Old Down Farm	153	**37.0**	223	**53.9**	38	**9.2**	**414**
Yarford	219	**45.6**	148	**30.8**	113	**23.5**	**480**
Suddern Farm	312	**18.8**	1289	**77.7**	58	**3.5**	**1659**
Micheldever Wood	320	**38.6**	356	**42.9**	154	**18.6**	**830**
Abbotstone Down	326	**50.4**	258	**39.9**	63	**9.7**	**647**
Houghton Down (Hamilton)	391	**28.7**	876	**64.4**	94	**6.9**	**1361**
Copse Farm	538	**65.4**	205	**24.9**	80	**9.7**	**823**
Brighton Hill	948	**52.6**	721	**40.0**	134	**7.4**	**1803**
Farleigh Wallop	948	**52.6**	721	**40.0**	134	**7.4**	**1803**
Owslebury	2758	**35.5**	3344	**43.1**	1660	**21.4**	**7762**
Wavendon Gate	611	**74.5**	174	**21.2**	35	**4.3**	**820**
Tolpuddle Ball	180	**24.6**	499	**68.2**	53	**7.2**	**732**
Whitcombe	492	**31.6**	1007	**64.6**	60	**3.8**	**1559**
Elms Farm	780	**65.4**	216	**18.1**	196	**16.4**	**1192**
Haddon	38	**46.9**	36	**44.4**	7	**8.6**	**81**
Orton Longueville	703	**53.1**	496	**37.5**	124	**9.4**	**1323**
Northwick	40	**26.8**	101	**67.8**	8	**5.4**	**149**

Site	Cattle		Sheep/Goat		Pig		TOTAL
	NISP	%	NISP	%	NISP	%	NISP
IA/RB transition: Rural - minor (n=36) continued							
Neigh Bridge	261	**57.5**	179	**39.4**	14	**3.1**	**454**
Birdlip	359	**60.2**	180	**30.2**	57	**9.6**	**596**
Barton Court Farm	868	**39.1**	1072	**48.3**	281	**12.7**	**2221**
Claydon Pike, Longdole's Field	965	**51.7**	727	**39.0**	173	**9.3**	**1865**
Frocester	1415	**33.0**	2311	**53.8**	566	**13.2**	**4292**
Gravelly Guy	1470	**39.6**	1878	**50.6**	362	**9.8**	**3710**
Keston	24	**9.4**	220	**85.9**	12	**4.7**	**256**
Sum of Percentages		**1568.4**		**1644.2**		**387.4**	**40774**
Mean Percentage		**43.6**		**45.7**		**10.8**	
IA/RB transition: Rural - nucleated (n=5)							
Braughing	1348	**31.3**	1546	**35.9**	1412	**32.8**	**4306**
Ditches	2028	**46.7**	1644	**37.9**	668	**15.4**	**4340**
Silchester, defences	273	**65.9**	109	**26.3**	32	**7.7**	**414**
Silchester	1761	**39.7**	1302	**29.4**	1369	**30.9**	**4432**
Skeleton Green	786	**32.3**	449	**18.4**	1202	**49.3**	**2437**
Sum of Percentages		**216.0**		**147.9**		**136.1**	**15929**
Mean Percentage		**43.2**		**29.6**		**27.2**	
IA/RB transition: Urban (n=2)							
Dorchester, Greyhound Yard	103	**22.6**	240	**52.6**	113	**24.8**	**456**
Lincoln	221	**61.0**	89	**24.6**	52	**14.4**	**362**
Sum of Percentages		**83.6**		**77.2**		**39.1**	**818**
Mean Percentage		**41.8**		**38.6**		**19.6**	
IA/RB trnasition: Religious (n=3)							
Bancroft, temple-mausoleum	256	**47.9**	208	**38.9**	71	**13.3**	**535**
Hayling Island	49	**2.0**	1407	**57.6**	988	**40.4**	**2444**
Uley Shrines	746	**24.3**	2261	**73.6**	63	**2.1**	**3070**
Sum of Percentages		**74.2**		**170.1**		**55.7**	**6049**
Mean Percentage		**24.7**		**56.7**		**18.6**	
Early Roman: Rural - minor (n=61)							
Appleford	189	**74.4**	53	**20.9**	12	**4.7**	**254**
Bancroft	117	**55.2**	81	**38.2**	14	**6.6**	**212**
Barton Court Farm	178	**56.2**	98	**30.9**	41	**12.9**	**317**
Biddenham Loop	189	**48.0**	159	**40.4**	46	**11.7**	**394**
Billingborough	310	**50.2**	279	**45.1**	29	**4.7**	**618**
Bishopstone	100	**29.9**	211	**63.0**	24	**7.2**	**335**
Blackhorse Road	42	**51.9**	31	**38.3**	8	**9.9**	**81**
Castle Copse	97	**44.7**	77	**35.5**	43	**19.8**	**217**
Charlton Kings	232	**51.1**	176	**38.8**	46	**10.1**	**454**
Chelmsford, mansio site AR	152	**47.5**	132	**41.3**	36	**11.3**	**320**
Chignall	676	**62.8**	232	**21.6**	168	**15.6**	**1076**
Clay Lane	64	**40.0**	83	**51.9**	13	**8.1**	**160**
Claydon Pike, Longdole's Field	1517	**49.2**	1340	**43.5**	226	**7.3**	**3083**
Cowbit	100	**74.1**	33	**24.4**	2	**1.5**	**135**
Dolland's Moor	263	**57.0**	147	**31.9**	51	**11.1**	**461**
Elms Farm	2904	**76.5**	689	**18.2**	201	**5.3**	**3794**
Elstead	464	**57.5**	305	**37.8**	38	**4.7**	**807**
Empingham	163	**14.0**	961	**82.4**	42	**3.6**	**1166**
Fishbourne, east (1995-2002)	539	**27.0**	584	**29.3**	872	**43.7**	**1995**
Fishbourne, Palace (1960-68)	941	**25.5**	1070	**29.0**	1676	**45.5**	**3687**

Site	Cattle		Sheep/Goat		Pig		TOTAL
	NISP	%	NISP	%	NISP	%	NISP
Early Roman: Rural - minor (n=61) continued							
Frocester	2072	**41.6**	2240	**44.9**	672	**13.5**	**4984**
Fullerton	130	**22.6**	381	**66.3**	64	**11.1**	**575**
Gorhambury	914	**41.3**	603	**27.2**	696	**31.5**	**2213**
Grateley South	258	**15.2**	1350	**79.7**	86	**5.1**	**1694**
Haddon	260	**41.6**	314	**50.2**	51	**8.2**	**625**
Haymes	307	**50.7**	258	**42.6**	41	**6.8**	**606**
Hengistbury Head	433	**86.6**	29	**5.8**	38	**7.6**	**500**
Houghton Down (Hammon)	37	**38.1**	56	**57.7**	4	**4.1**	**97**
Kelvedon	140	**55.6**	75	**29.8**	37	**14.7**	**252**
Kilverstone	85	**46.7**	89	**48.9**	8	**4.4**	**182**
Little Oakley	178	**61.0**	81	**27.7**	33	**11.3**	**292**
Little Somborne	116	**32.5**	221	**61.9**	20	**5.6**	**357**
Manor Farm	48	**32.0**	85	**56.7**	17	**11.3**	**150**
Mount Roman villa	143	**65.3**	50	**22.8**	26	**11.9**	**219**
Nash	1745	**97.5**	39	**2.2**	6	**0.3**	**1790**
Newhaven	181	**54.0**	119	**35.5**	35	**10.4**	**335**
Newquay, Atlantic Road	146	**18.6**	595	**75.6**	46	**5.8**	**787**
North Shoebury	43	**36.1**	58	**48.7**	18	**15.1**	**119**
Orton Hall Farm	1158	**44.6**	1350	**52.0**	86	**3.3**	**2594**
Orton Longueville	551	**53.6**	405	**39.4**	72	**7.0**	**1028**
Owslebury	515	**38.2**	620	**46.0**	213	**15.8**	**1348**
Parnwell	66	**62.9**	36	**34.3**	3	**2.9**	**105**
Pasture Lodge Farm	331	**40.5**	402	**49.1**	85	**10.4**	**818**
Peene	79	**46.2**	76	**44.4**	16	**9.4**	**171**
Rucstalls	258	**45.7**	248	**44.0**	58	**10.3**	**564**
Runfold	232	**70.5**	82	**24.9**	15	**4.6**	**329**
Stonea	419	**40.0**	502	**47.9**	127	**12.1**	**1048**
Tewkesbury	222	**39.0**	301	**52.9**	46	**8.1**	**569**
Thorpe Lea	113	**72.4**	34	**21.8**	9	**5.8**	**156**
Thruxton	89	**44.9**	97	**49.0**	12	**6.1**	**198**
Tort Hill East	50	**47.2**	47	**44.3**	9	**8.5**	**106**
Tort Hill West	78	**45.6**	78	**45.6**	15	**8.8**	**171**
Uffington White Horse	85	**27.7**	183	**59.6**	39	**12.7**	**307**
Watkins Farm	278	**69.2**	100	**24.9**	24	**6.0**	**402**
Wavendon Gate	330	**82.3**	64	**16.0**	7	**1.7**	**401**
Weekley	479	**48.7**	368	**37.4**	137	**13.9**	**984**
West Stow	257	**40.6**	279	**44.1**	97	**15.3**	**633**
Whelford Bowmoor	165	**81.7**	34	**16.8**	3	**1.5**	**202**
Whitton	2185	**38.6**	2465	**43.6**	1008	**17.8**	**5658**
Winnall Down	831	**46.4**	831	**46.4**	129	**7.2**	**1791**
Worth Maltravers, Compact Farm	34	**16.1**	160	**75.8**	17	**8.1**	**211**
Sum of Percentages		**2972.1**		**2506.8**		**621.1**	**55137**
Mean Percentage		**48.7**		**41.1**		**10.2**	
Early Roman: Rural - nucleated (n=23)							
Alcester	552	**57.9**	319	**33.5**	82	**8.6**	**953**
Alcester, AES 76-7	843	**62.1**	445	**32.8**	70	**5.2**	**1358**
Asthall	160	**34.1**	242	**51.6**	67	**14.3**	**469**
Baldock	472	**59.1**	234	**29.3**	93	**11.6**	**799**
Braughing	471	**30.0**	808	**51.5**	290	**18.5**	**1569**
Carlisle, The Lanes	869	**64.6**	299	**22.2**	177	**13.2**	**1345**
Castleford	2346	**58.4**	1139	**28.3**	534	**13.3**	**4019**
Catterick, Catterick Bridge	194	**78.2**	38	**15.3**	16	**6.5**	**248**
Chelmsford, site AA	176	**42.0**	203	**48.4**	40	**9.5**	**419**
Chelmsford, site S	543	**39.5**	556	**40.5**	274	**20.0**	**1373**

Site	Cattle		Sheep/Goat		Pig		TOTAL
	NISP	%	NISP	%	NISP	%	NISP
Early Roman: Rural - nucleated (n=23) continued							
Cirencester (Thawley)	85	**47.2**	59	**32.8**	36	**20.0**	**180**
Conderton Camp	389	**22.9**	1105	**65.0**	205	**12.1**	**1699**
Dragonby	672	**25.9**	1590	**61.3**	331	**12.8**	**2593**
Droitwich, Hanbury Street	93	**41.7**	80	**35.9**	50	**22.4**	**223**
Grandford	442	**29.3**	923	**61.2**	144	**9.5**	**1509**
Hacheston	459	**63.0**	205	**28.1**	65	**8.9**	**729**
Neatham	120	**38.3**	172	**55.0**	21	**6.7**	**313**
Norbury Camp	85	**35.4**	143	**59.6**	12	**5.0**	**240**
Poundbury	630	**22.4**	2070	**73.6**	113	**4.0**	**2813**
Shepton Mallet	394	**53.4**	283	**38.3**	61	**8.3**	**738**
Wilcote	146	**15.7**	633	**67.9**	153	**16.4**	**932**
Worcester, Deansway	457	**55.8**	243	**29.7**	119	**14.5**	**819**
Worcester, Sidbury	382	**42.9**	437	**49.1**	71	**8.0**	**890**
Sum of Percentages		**1019.9**		**1010.9**		**269.2**	**26230**
Mean Percentage		**44.3**		**44.0**		**11.7**	
Early Roman: Urban (n=23)							
Caerleon, baths	84	**21.0**	254	**63.5**	62	**15.5**	**400**
Canterbury Castle	609	**22.3**	1164	**42.6**	961	**35.1**	**2734**
Chichester, Cattlemarket	2879	**62.4**	1230	**26.7**	506	**11.0**	**4615**
Chichester, Rowes Garage	166	**77.6**	31	**14.5**	17	**7.9**	**214**
Cirencester (Maltby)	3001	**64.5**	983	**21.1**	671	**14.4**	**4655**
Colchester, Balkerne Heights	271	**53.0**	136	**26.6**	104	**20.4**	**511**
Colchester, Balkerne Lane	3488	**62.9**	1323	**23.8**	738	**13.3**	**5549**
Colchester, Culver Street	626	**31.6**	579	**29.2**	778	**39.2**	**1983**
Colchester, Gilberd School	500	**35.8**	445	**31.9**	451	**32.3**	**1396**
Colchester, Sheepen	3107	**51.7**	1188	**19.8**	1714	**28.5**	**6009**
Dorchester, County Hall	308	**29.4**	688	**65.6**	52	**5.0**	**1048**
Dorchester, County Hospital	131	**33.9**	189	**48.8**	67	**17.3**	**387**
Dorchester, Greyhound Yard	2685	**35.8**	2952	**39.3**	1868	**24.9**	**7505**
Dorchester, South Grove cottage	39	**40.2**	54	**55.7**	4	**4.1**	**97**
Exeter	1713	**47.7**	1070	**29.8**	806	**22.5**	**3589**
Ilchester	289	**50.8**	242	**42.5**	38	**6.7**	**569**
Leicester, Little Lane	749	**45.8**	525	**32.1**	360	**22.0**	**1634**
Lincoln	165	**70.8**	43	**18.5**	25	**10.7**	**233**
Silchester, defences	201	**55.5**	91	**25.1**	70	**19.3**	**362**
Silchester, forum basilica	1005	**41.5**	764	**31.6**	652	**26.9**	**2421**
Southwark, Winchester Palace	81	**23.1**	63	**18.0**	206	**58.9**	**350**
Wroxeter, baths and macellum	799	**49.3**	442	**27.3**	380	**23.4**	**1621**
York, General Accident site	5317	**66.6**	1493	**18.7**	1169	**14.7**	**7979**
Sum of Percentages		**1073.2**		**752.7**		**474.1**	**55861**
Mean Percentage		**46.7**		**32.7**		**20.6**	
Early Roman: Military (n=19)							
Alchester	335	**33.8**	453	**45.8**	202	**20.4**	**990**
Birdoswald	472	**55.9**	288	**34.1**	85	**10.1**	**845**
Brancaster	1362	**65.4**	643	**30.9**	77	**3.7**	**2082**
Caerleon, baths	633	**74.2**	108	**12.7**	112	**13.1**	**853**
Caerleon, scamnum tribunorum	362	**52.7**	112	**16.3**	213	**31.0**	**687**
Caernarfon	1280	**55.5**	340	**14.7**	688	**29.8**	**2308**
Caistor-on-sea	116	**84.1**	6	**4.3**	16	**11.6**	**138**
Castleford	11069	**66.0**	4057	**24.2**	1648	**9.8**	**16774**
Cirencester (Thawley)	306	**49.9**	201	**32.8**	106	**17.3**	**613**
Colchester, Balkerne Lane	2905	**70.1**	720	**17.4**	520	**12.5**	**4145**

Site	Cattle		Sheep/Goat		Pig		TOTAL
	NISP	%	NISP	%	NISP	%	NISP
Early Roman: Military (n=19) continued							
Colchester, Culver Street	412	**44.3**	215	**23.1**	304	**32.7**	**931**
Colchester, Gilberd School	273	**32.1**	264	**31.1**	313	**36.8**	**850**
Droitwich, Dodderhill	141	**62.7**	74	**32.9**	10	**4.4**	**225**
Exeter	497	**42.8**	388	**33.4**	276	**23.8**	**1161**
Hod Hill	151	**21.9**	459	**66.4**	81	**11.7**	**691**
Loughor	1834	**59.0**	546	**17.6**	728	**23.4**	**3108**
Ribchester	1572	**63.1**	633	**25.4**	285	**11.4**	**2490**
Wallsend	820	**61.1**	263	**19.6**	260	**19.4**	**1343**
Wroxeter, fortress	1839	**49.4**	993	**26.7**	890	**23.9**	**3722**
Sum of Percentages		**1043.8**		**509.3**		**346.9**	**43956**
Mean Percentage		**54.9**		**26.8**		**18.3**	
Early Roman: Religious (n=8)							
Chelmsford, temple site	386	**21.2**	1289	**70.8**	146	**8.0**	**1821**
Haddenham III, Snow's Farm	464	**6.7**	5081	**73.0**	1417	**20.4**	**6962**
Hayling Island	54	**1.1**	2717	**55.0**	2168	**43.9**	**4939**
Rocester	129	**63.9**	45	**22.3**	28	**13.9**	**202**
Slonk Hill	162	**23.1**	296	**42.2**	243	**34.7**	**701**
St Albans, Folly Lane	2491	**88.9**	218	**7.8**	94	**3.4**	**2803**
Uley Shrines	1336	**11.7**	9749	**85.6**	305	**2.7**	**11390**
Witham	975	**88.5**	100	**9.1**	27	**2.5**	**1102**
Sum of Percentages		**305.0**		**365.7**		**129.3**	**29920.0**
Mean Percentage		**38.1**		**45.7**		**16.2**	
Late Roman: Rural - minor (n=60)							
Ashville Trading Estate	64	**37.0**	91	**52.6**	18	**10.4**	**173**
Avonmouth	66	**30.8**	135	**63.1**	13	**6.1**	**214**
Balksbury Camp	299	**41.5**	383	**53.2**	38	**5.3**	**720**
Bancroft	2274	**54.3**	1367	**32.6**	547	**13.1**	**4188**
Barnsley Park	3781	**32.7**	6529	**56.5**	1236	**10.7**	**11546**
Barton Court Farm	1906	**59.5**	975	**30.4**	324	**10.1**	**3205**
Batten Hanger	461	**60.8**	196	**25.9**	101	**13.3**	**758**
Bignor	267	**76.9**	62	**17.9**	18	**5.2**	**347**
Castle Copse	164	**10.1**	318	**19.6**	1139	**70.3**	**1621**
Chapperton Down	348	**46.5**	362	**48.3**	39	**5.2**	**749**
Chignall	1576	**75.5**	399	**19.1**	113	**5.4**	**2088**
Chilgrove 2	1739	**70.1**	664	**26.8**	79	**3.2**	**2482**
Claydon Pike, Longdole's Field	1715	**52.8**	1253	**38.6**	280	**8.6**	**3248**
Dalton Parlours	346	**25.8**	757	**56.5**	237	**17.7**	**1340**
Dolland's Moor	51	**51.5**	42	**42.4**	6	**6.1**	**99**
Droitwich, Bays Meadow	1204	**61.9**	477	**24.5**	264	**13.6**	**1945**
Duckpool	87	**46.8**	52	**28.0**	47	**25.3**	**186**
Elms Farm	874	**85.4**	96	**9.4**	54	**5.3**	**1024**
Empingham North	31	**28.2**	64	**58.2**	15	**13.6**	**110**
Empingham North, well	15	**10.5**	77	**53.8**	51	**35.7**	**143**
Farmoor	204	**62.6**	106	**32.5**	16	**4.9**	**326**
Fishbourne, east (1995-2002)	36	**26.9**	38	**28.4**	60	**44.8**	**134**
Fishbourne, Harbour	105	**47.7**	61	**27.7**	54	**24.5**	**220**
Fishbourne, Palace (1960-68)	87	**31.1**	85	**30.4**	108	**38.6**	**280**
Fishbourne, Westward House	360	**51.1**	152	**21.6**	192	**27.3**	**704**
Frocester	3508	**58.3**	1822	**30.3**	685	**11.4**	**6015**
Gorhambury	370	**53.4**	186	**26.8**	137	**19.8**	**693**
Great Holts Farm	93	**86.9**	8	**7.5**	6	**5.6**	**107**
Haddon	301	**41.2**	392	**53.7**	37	**5.1**	**730**
Houghton Down (Hammon)	103	**24.5**	274	**65.2**	43	**10.2**	**420**

Site	Cattle		Sheep/Goat		Pig		TOTAL
	NISP	%	NISP	%	NISP	%	NISP
Late Roman: Rural - minor (n=60) continued							
Kelvedon	114	**70.4**	42	**25.9**	6	**3.7**	**162**
Keston	517	**63.1**	167	**20.4**	135	**16.5**	**819**
Kilverstone	112	**53.8**	85	**40.9**	11	**5.3**	**208**
Little Somborne	145	**55.1**	102	**38.8**	16	**6.1**	**263**
Minchin Hole Cave	25	**23.6**	70	**66.0**	11	**10.4**	**106**
Monk Sherborne	294	**51.0**	243	**42.2**	39	**6.8**	**576**
Newquay, Atlantic Road	112	**17.3**	500	**77.4**	34	**5.3**	**646**
North Shoebury	116	**62.4**	57	**30.6**	13	**7.0**	**186**
Orton Hall Farm	5868	**65.5**	2799	**31.2**	296	**3.3**	**8963**
Orton Longueville	510	**52.0**	409	**41.7**	62	**6.3**	**981**
Owslebury	2473	**37.7**	3581	**54.5**	512	**7.8**	**6566**
Pasture Lodge farm	470	**51.3**	342	**37.3**	104	**11.4**	**916**
Portway	202	**72.7**	72	**25.9**	4	**1.4**	**278**
Poxwell	44	**40.4**	58	**53.2**	7	**6.4**	**109**
Ranscombe Hill	85	**52.1**	56	**34.4**	22	**13.5**	**163**
Renner's Park, well	129	**73.3**	36	**20.5**	11	**6.3**	**176**
Rucstalls	112	**59.3**	77	**40.7**	0	**0.0**	**189**
Shadwell	256	**71.7**	55	**15.4**	46	**12.9**	**357**
Shakenoak	1818	**57.5**	855	**27.0**	490	**15.5**	**3163**
Stonea	1294	**44.4**	1279	**43.9**	340	**11.7**	**2913**
Thorpe Lea	224	**70.7**	83	**26.2**	10	**3.2**	**317**
Tort Hill East	47	**45.2**	51	**49.0**	6	**5.8**	**104**
Wainscott	45	**47.9**	25	**26.6**	24	**25.5**	**94**
Watergate	288	**60.9**	92	**19.5**	93	**19.7**	**473**
Wavendon Gate	437	**78.2**	107	**19.1**	15	**2.7**	**559**
Wayside Farm	1072	**90.9**	86	**7.3**	21	**1.8**	**1179**
Westhampnett	99	**49.5**	75	**37.5**	26	**13.0**	**200**
Whitcombe	129	**38.2**	190	**56.2**	19	**5.6**	**338**
Worplesdon	92	**57.9**	58	**36.5**	9	**5.7**	**159**
Yarford	147	**27.3**	220	**40.9**	171	**31.8**	**538**
Sum of Percentages		**3083.5**		**2168.3**		**748.2**	**77516.0**
Mean Percentage		**51.4**		**36.1**		**12.5**	
Late Roman: Rural - nucleated (n=26)							
Alcester	6834	**66.0**	2335	**22.5**	1186	**11.5**	**10355**
Alcester, defences	1195	**45.3**	1166	**44.2**	275	**10.4**	**2636**
Asthall	249	**46.7**	233	**43.7**	51	**9.6**	**533**
Baldock	119	**55.6**	67	**31.3**	28	**13.1**	**214**
Braughing	406	**39.8**	490	**48.0**	125	**12.2**	**1021**
Carlisle, The Lanes	173	**79.0**	26	**11.9**	20	**9.1**	**219**
Castleford	2481	**65.5**	865	**22.8**	440	**11.6**	**3786**
Catterick, Bainesse	3284	**51.7**	2143	**33.7**	926	**14.6**	**6353**
Catterick, Catterick Bridge	639	**65.3**	257	**26.3**	83	**8.5**	**979**
Catterick, Thornbrough Farm	808	**52.6**	435	**28.3**	292	**19.0**	**1535**
Chelmsford, site S	269	**68.8**	90	**23.0**	32	**8.2**	**391**
Chelmsford, site T	155	**85.6**	21	**11.6**	5	**2.8**	**181**
Coygan Camp	2907	**63.2**	807	**17.5**	887	**19.3**	**4601**
Dragonby	305	**38.7**	382	**48.5**	101	**12.8**	**788**
Droitwich, Hanbury Street	94	**56.0**	39	**23.2**	35	**20.8**	**168**
Grandford	1078	**31.8**	2022	**59.7**	287	**8.5**	**3387**
Great Dunmow	579	**70.6**	219	**26.7**	22	**2.7**	**820**
Hacheston	3705	**68.0**	1147	**21.0**	598	**11.0**	**5450**
Kingscote	2377	**44.2**	2167	**40.3**	828	**15.4**	**5372**
Neatham	950	**68.1**	318	**22.8**	127	**9.1**	**1395**
Piercebridge, large vicus building	2075	**57.8**	890	**24.8**	622	**17.3**	**3587**

Site	Cattle		Sheep/Goat		Pig		TOTAL
	NISP	%	NISP	%	NISP	%	NISP
Late Roman: Rural - nucleated (n=26) continued							
Piercebridge, outer ditch	4650	**64.8**	1222	**17.0**	1300	**18.1**	**7172**
Poundbury	588	**43.2**	621	**45.6**	153	**11.2**	**1362**
Wilcote	1197	**33.3**	2104	**58.6**	291	**8.1**	**3592**
Worcester, Deansway	743	**56.9**	255	**19.5**	308	**23.6**	**1306**
Worcester, Sidbury	1690	**60.3**	874	**31.2**	237	**8.5**	**2801**
Sum of Percentages		**1479.0**		**804.0**		**317.0**	**70004.0**
Mean Percentage		**56.9**		**30.9**		**12.2**	
Late Roman: Urban (n=21)							
Caerwent	386	**70.1**	103	**18.7**	62	**11.3**	**551**
Chichester, Cattlemarket	2994	**56.6**	1592	**30.1**	707	**13.4**	**5293**
Chichester, Lavant Culvert	59	**58.4**	29	**28.7**	13	**12.9**	**101**
Cirencester (Maltby)	7409	**66.2**	2184	**19.5**	1602	**14.3**	**11195**
Colchester, Balkerne Lane	6099	**66.2**	1824	**19.8**	1291	**14.0**	**9214**
Colchester, Culver Street	781	**37.5**	567	**27.2**	734	**35.3**	**2082**
Dorchester, County Hall	187	**48.8**	148	**38.6**	48	**12.5**	**383**
Dorchester, County Hospital	340	**47.2**	285	**39.6**	95	**13.2**	**720**
Dorchester, Greyhound Yard	3342	**40.1**	2906	**34.8**	2092	**25.1**	**8340**
Dorchester, South Grove cottage	69	**52.3**	50	**37.9**	13	**9.8**	**132**
Exeter	1838	**56.5**	700	**21.5**	714	**22.0**	**3252**
Ilchester	516	**78.2**	126	**19.1**	18	**2.7**	**660**
Ilchester, Great Yard	201	**43.8**	229	**49.9**	29	**6.3**	**459**
Lincoln	4441	**76.9**	899	**15.6**	436	**7.5**	**5776**
London, Walbrook Mithraeum	98	**53.3**	28	**15.2**	58	**31.5**	**184**
Silchester, defences	164	**50.0**	73	**22.3**	91	**27.7**	**328**
Silchester, forum-basilica	906	**28.4**	1479	**46.4**	805	**25.2**	**3190**
Silchester, insula IX	1510	**67.4**	414	**18.5**	318	**14.2**	**2242**
Southwark, Winchester Palace	77	**52.4**	11	**7.5**	59	**40.1**	**147**
Wroxeter, baths and macellum	3428	**69.5**	798	**16.2**	706	**14.3**	**4932**
York, General Accident site	170	**62.3**	52	**19.0**	51	**18.7**	**273**
Sum of Percentages		**1181.9**		**546.1**		**372.1**	**59454.0**
Mean Percentage		**56.3**		**26.0**		**17.7**	
Late Roman: Military (n=9)							
Birdoswald	632	**69.5**	211	**23.2**	67	**7.4**	**910**
Brancaster	53	**35.1**	66	**43.7**	32	**21.2**	**151**
Burgh Castle	312	**72.6**	54	**12.6**	64	**14.9**	**430**
Caerleon, baths	3742	**78.1**	568	**11.9**	480	**10.0**	**4790**
Caernarfon	8388	**78.9**	643	**6.0**	1600	**15.1**	**10631**
Caistor-on-sea	2456	**72.9**	395	**11.7**	520	**15.4**	**3371**
Carr Naze	175	**18.5**	437	**46.2**	334	**35.3**	**946**
Piercebridge, inner ditch	7767	**68.6**	2034	**18.0**	1518	**13.4**	**11319**
Portchester	10774	**64.7**	3212	**19.3**	2654	**15.9**	**16640**
Sum of Percentages		**558.9**		**192.5**		**148.6**	**49188.0**
Mean Percentage		**62.1**		**21.4**		**16.5**	
Late Roman: Religious (n=11)							
Bath	2092	**51.9**	1170	**29.0**	766	**19.0**	**4028**
Brigstock	46	**33.8**	79	**58.1**	11	**8.1**	**136**
Chanctonbury Ring	15	**0.3**	36	**0.7**	4874	**99.0**	**4925**
Chanctonbury Ring, temenos ditch	317	**58.9**	212	**39.4**	9	**1.7**	**538**
Chelmsford, temple site	214	**57.5**	110	**29.6**	48	**12.9**	**372**
Great Dumnow	49	**41.5**	55	**46.6**	14	**11.9**	**118**

Site	Cattle		Sheep/Goat		Pig		TOTAL
	NISP	%	NISP	%	NISP	%	NISP
Late Roman: Religious (n=11) continued							
Henley Wood	30	**14.4**	138	**66.3**	40	**19.2**	**208**
Lowbury Hill	124	**21.9**	338	**59.6**	105	**18.5**	**567**
St Albans, Folly Lane	346	**46.2**	298	**39.8**	105	**14.0**	**749**
Uley Shrines	1773	**4.5**	37238	**93.8**	683	**1.7**	**39694**
Witham	1204 7	**78.6**	2087	**13.6**	1187	**7.7**	**15321**
Sum of Percentages		**409.6**		**476.6**		**213.7**	**66656.0**
Mean Percentage		**37.2**		**43.3**		**19.4**	

Appendix A.II; Horse and dog NISP and mean percentages by site type and date

Site name	Cattle	Sheep/Goat	Horse	Dog	%Horse	%Dog
Middle Iron Age: Rural - minor (n=32)						
Appleford	198	99	53	31	15.1	9.5
Ashville Trading Estate	366	727	47	7	4.1	0.6
Aston Mill Farm	279	276	42	4	7.0	0.7
Biddenham Loop	180	144	35	2	9.7	0.6
Blackhorse Road	294	104	57	0	12.5	0.0
Bramdean	277	498	49	17	5.9	2.1
Brighton Hill	134	292	36	1	7.8	0.2
Chilbolton Down	113	229	63	3	15.6	0.9
Claydon Pike, Warrens Field	330	279	121	0	16.6	0.0
Dolland's Moor	214	149	34	7	8.6	1.9
Easton Lane	72	160	19	1	7.6	0.4
Eldon's Seat	140	305	14	1	3.1	0.2
Farleigh Wallop	134	292	36	1	7.8	0.2
Farmoor	70	51	33	5	21.4	4.0
Gravelly Guy	2910	4260	618	145	7.9	2.0
Groundwell Farm	556	1882	88	18	3.5	0.7
Hawk's Hill	234	738	49	3	4.8	0.3
Houghton Down (Hamilton)	779	1792	133	613	4.9	19.3
Kingsmead South	167	244	27	0	6.2	0.0
Market Deeping	138	151	43	5	13.0	1.7
Micheldever Wood	836	1147	87	54	4.2	2.7
Old Down Farm	401	1046	259	180	15.2	11.1
Owslebury	886	1004	116	150	5.8	7.4
Rooksdown	324	653	269	227	21.6	18.9
Slonk Hill	144	208	24	5	6.4	1.4
Spratsgate Lane	322	272	114	3	16.1	0.5
Suddern Farm	1267	2961	380	115	8.2	2.6
Thorpes Thewles	747	323	166	14	13.4	1.3
Weekley	281	1327	36	6	2.2	0.4
Winnall Down	838	1307	244	74	10.2	3.3
Woolbury	25	64	1	0	1.1	0.0
			Mean Percentage		9.2	3.0
Middle Iron Age: Rural - nucleated (n=8)						
Bury Hill	153	317	466	8	49.8	1.7
Bury Wood Camp	124	235	13	3	3.5	0.8
Conderton Camp	758	2165	72	13	2.4	0.4
Danebury	7068	21283	1149	745	3.9	2.6
Dragonby	527	1029	28	12	1.8	0.8
Maiden Castle	908	3009	72	66	1.8	1.7
Uley Bury	131	181	0	12	0.0	3.7
Winklebury Camp	759	1802	196	155	7.1	5.7
			Mean Percentage		8.8	3.3
Late Iron Age: Rural - minor (n=69)						
Abbeymead	49	105	14	0	8.3	0.0
Ashville Trading Estate	290	334	37	3	5.6	0.5
Balksbury Camp	1490	2606	512	604	11.1	12.9
Barton Court Farm	443	415	95	48	10.0	5.3
Bicester Fields Farm	361	206	33	5	5.5	0.9
Biddenham Loop, domestic and ritual	54	67	11	20	8.3	14.2
Billingborough	964	757	252	292	12.8	14.5
Birdlip	149	71	59	3	21.1	1.3

Site name	Cattle	Sheep/Goat	Horse	Dog	%Horse	%Dog
Late Iron Age: Rural - minor (n=69) continued						
Bishopstone	304	247	89	26	13.9	4.5
Blackthorn	68	74	10	0	6.6	0.0
Brighton Hill	159	338	19	9	3.7	1.8
Chignall	164	17	15	2	7.7	1.1
Clay Lane	642	516	141	9	10.9	0.8
Copse Farm	241	138	114	19	23.1	4.8
Dalton Parlours	166	195	8	308	2.2	46.0
Dolland's Moor	237	495	36	9	4.7	1.2
Easton Lane	45	149	16	7	7.6	3.5
Edix Hill	177	50	35	19	13.4	7.7
Farleigh Wallop	159	337	19	9	3.7	1.8
Farningham Hill	221	336	7	10	1.2	1.8
Fishbourne, east (1995-2002)	24	148	0	2	0.0	1.1
Flagstones	471	49	223	681	30.0	56.7
Frocester	630	954	121	12	7.1	0.8
Gloucester, Coppice Corner	102	364	5	0	1.1	0.0
Gorhambury	81	39	18	22	13.0	15.5
Grateley South	202	445	25	7	3.7	1.1
Haddenham V	837	2446	84	11	2.5	0.3
Haddenham VI	86	232	10	1	3.0	0.3
Hallen	797	1078	131	17	6.5	0.9
Houghton Down (Hammon)	132	153	24	9	7.8	3.1
Little Oakley	78	61	4	0	2.8	0.0
Little Somborne	268	256	47	120	8.2	18.6
Mingies Ditch	521	914	203	5	12.4	0.3
Moulton Park	364	192	36	19	6.1	3.3
Nettlebank Copse	938	1360	178	253	7.2	9.9
North Bersted	259	203	19	10	4.0	2.1
North Shoebury	33	67	7	7	6.5	6.5
Orton Longueville	348	338	25	2	3.5	0.3
Owslebury	477	2688	110	436	3.4	12.1
Oxley Park West	104	67	38	1	18.2	0.6
Rucstalls	233	470	25	3	3.4	0.4
Runfold	420	201	150	10	19.5	1.6
Slonk Hill	54	146	17	4	7.8	2.0
Suddern Farm	690	711	97	320	6.5	18.6
Thorpe Lea	96	61	21	10	11.8	6.0
Thorpes Thewles	841	411	135	14	9.7	1.1
Thruxton	53	49	7	32	6.4	23.9
Tolpuddle Ball	110	191	51	88	14.5	22.6
Tort Hill West	64	48	9	5	7.4	4.3
Travelegue	192	96	16	0	5.3	0.0
Wardy Hill	371	708	52	42	4.6	3.7
Watkins Farm	405	429	237	34	22.1	3.9
Wavendon Gate	413	79	67	11	12.0	2.2
Weekley	1424	1266	136	38	4.8	1.4
West Stow	1390	890	215	22	8.6	1.0
Worth Maltravers, Compact Farm	453	1573	21	27	1.0	1.3
			Mean Percentage		7.9	5.3
Late Iron Age: Rural - nucleated (n=9)						
Baldock	39	22	4	1	6.2	1.6
Cadbury Congresbury	604	134	7	5	0.9	0.7
Coygan Camp	381	101	5	0	1.0	0.0
Danebury	417	716	96	291	7.8	20.4
Dragonby	2273	4423	234	119	3.4	1.7

Site name	Cattle	Sheep/Goat	Horse	Dog	%Horse	%Dog
Late Iron Age: Rural - nucleated (n=9) continued						
Grimthorpe	403	184	54	13	8.4	2.2
Silchester, oppidum	1454	820	53	36	2.3	1.6
Sutton Walls	863	752	74	8	4.4	0.5
Uley Bury	175	215	1	0	0.3	0.0
			Mean Percentage		7.3	4.9
Late Iron Age: Religious (n=4)						
Bancroft, temple-mausoleum	503	317	50	5	5.7	0.6
Haddenham IV	65	53	10	0	7.8	0.0
Uley Shrines	217	554	12	11	1.5	1.4
Witham	899	467	100	2	6.8	0.1
			Mean Percentage		6.7	4.7
IA/RB transition: Rural - minor (n=36)						
Abbotstone Down	326	258	46	24	7.3	3.9
Balksbury Camp	98	211	28	12	8.3	3.7
Barton Court Farm	868	1072	205	48	9.6	2.4
Birdlip	359	180	74	3	12.1	0.6
Brighton Hill	948	721	131	38	7.3	2.2
Burgh	585	697	51	7	3.8	0.5
Carne's Seat	85	117	12	2	5.6	1.0
Claydon Pike, Longdole's Field	965	727	186	13	9.9	0.8
Copse Farm	538	205	259	39	25.8	5.0
Easton Lane	120	68	30	3	13.8	1.6
Elms Farm	780	216	38	8	3.7	0.8
Farleigh Wallop	948	721	131	29	7.3	1.7
Fishbourne, Westward House	81	61	16	0	10.1	0.0
Frocester	1415	2311	283	47	7.1	1.2
Gravelly Guy	1470	1878	241	87	6.7	2.5
Haddon	38	36	5	14	6.3	15.9
Houghton Down (Hamilton)	391	876	110	220	8.0	14.8
Keston	24	220	1	18	0.4	6.9
Lavant	75	55	3	1	2.3	0.8
Martin	82	18	18	12	15.3	10.7
Micheldever Wood	320	356	86	34	11.3	4.8
Neigh Bridge	261	179	158	48	26.4	9.8
Northwick	40	101	4	1	2.8	0.7
Old Down Farm	153	223	27	7	6.7	1.8
Orton Longueville	703	496	35	6	2.8	0.5
Ounces Barn	114	27	9	0	6.0	0.0
Owslebury	2758	3344	358	715	5.5	10.5
Rooksdown	112	224	47	11	12.3	3.2
Suddern Farm	312	1289	53	107	3.2	6.3
Tolpuddle Ball	180	499	72	251	9.6	27.0
Twyford Down	43	203	10	4	3.9	1.6
Wavendon Gate	611	174	124	27	13.6	3.3
Whitcombe	492	1007	58	25	3.7	1.6
Winnall Down	69	70	26	1	15.8	0.7
Woolbury	69	99	18	3	9.7	1.8
Yarford	219	148	22	8	5.7	2.1
			Mean Percentage		8.5	4.4
IA/RB transition: Rural - nucleated (n=5)						
Braughing	1348	1546	53	33	1.8	1.1
Ditches	2028	1644	27	25	0.7	0.7

Site name	Cattle	Sheep/Goat	Horse	Dog	%Horse	%Dog
IA/RB transition: Rural - nucleated (n=5) continued						
Silchester	1761	109	**60**	**3**	**3.1**	**0.2**
Silchester, defences	273	1302	**1**	**18**	**0.1**	**1.1**
Skeleton Green	786	449	**29**	**34**	**2.3**	**2.7**
			Mean Percentage		**7.1**	**4.6**
IA/RB transition: Urban (n=2)						
Dorchester, Greyhound Yard	103	240	**5**	**5**	**1.4**	**1.4**
Lincoln	221	89	**26**	**28**	**7.7**	**8.3**
			Mean Percentage		**6.8**	**4.2**
IA/RB transition: Religious (n=3)						
Bancroft, temple-mausoleum	256	208	**92**	**8**	**16.5**	**1.7**
Hayling Island	49	1407	**46**	**1**	**3.1**	**0.1**
Uley Shrines	746	2261	**47**	**19**	**1.5**	**0.6**
			Mean Percentage		**6.1**	**3.5**
Early Roman: Rural - minor (n=60)						
Appleford	189	53	**18**	**8**	**6.9**	**3.2**
Bancroft	117	81	**12**	**6**	**5.7**	**2.9**
Barton Court Farm	178	98	**43**	**4**	**13.5**	**1.4**
Biddenham Loop	189	159	**32**	**10**	**8.4**	**2.8**
Billingborough	310	279	**56**	**10**	**8.7**	**1.7**
Bishopstone	100	211	**69**	**8**	**18.2**	**2.5**
Castle Copse	97	77	**7**	**0**	**3.9**	**0.0**
Charlton Kings	232	176	**23**	**21**	**5.3**	**4.9**
Chelmsford, mansio site AR	152	132	**79**	**16**	**21.8**	**5.3**
Chignall	676	232	**84**	**17**	**8.5**	**1.8**
Clay Lane	64	83	**29**	**2**	**16.5**	**1.3**
Claydon Pike, Longdole's Field	1517	1340	**147**	**48**	**4.9**	**1.7**
Cowbit	100	33	**2**	**5**	**1.5**	**3.6**
Dolland's Moor	263	147	**29**	**12**	**6.6**	**2.8**
Elms Farm	2904	689	**52**	**95**	**1.4**	**2.6**
Elstead	464	305	**26**	**17**	**3.3**	**2.2**
Empingham	163	961	**3**	**6**	**0.3**	**0.5**
Fishbourne, east (1995-2002)	739	584	**137**	**18**	**9.4**	**1.3**
Fishbourne, Palace (1960-68)	941	1070	**77**	**36**	**3.7**	**1.8**
Frocester	2072	2240	**336**	**168**	**7.2**	**3.8**
Fullerton	130	381	**51**	**15**	**9.1**	**2.9**
Gorhambury	914	603	**124**	**104**	**7.6**	**6.4**
Grateley South	258	1350	**37**	**176**	**2.2**	**9.9**
Haddon	260	314	**52**	**17**	**8.3**	**2.9**
Haymes	307	258	**24**	**21**	**4.1**	**3.6**
Hengistbury Head	433	29	**0**	**0**	**0.0**	**0.0**
Houghton Down (Hammon)	37	56	**7**	**0**	**7.0**	**0.0**
Kelvedon	140	75	**8**	**2**	**3.6**	**0.9**
Kilverstone	85	89	**39**	**29**	**18.3**	**14.3**
Little Oakley	178	81	**2**	**2**	**0.8**	**0.8**
Little Somborne	116	221	**28**	**6**	**7.7**	**1.7**
Manor Farm	48	85	**0**	**0**	**0.0**	**0.0**
Mount Roman villa	143	50	**19**	**4**	**9.0**	**2.0**
Nash	1745	39	**20**	**2**	**1.1**	**0.1**
Newhaven	181	119	**30**	**66**	**9.1**	**18.0**
Newquay, Atlantic Road	146	595	**6**	**3**	**0.8**	**0.4**
North Shoebury	43	58	**17**	**5**	**14.4**	**4.7**
Orton Hall Farm	1158	1350	**56**	**70**	**2.2**	**2.7**

Site name	Cattle	Sheep/Goat	Horse	Dog	%Horse	%Dog
Early Roman: Rural - minor (n=60) continued						
Orton Longueville	551	405	86	15	8.3	1.5
Owslebury	515	620	91	98	7.4	7.9
Parnwell	66	36	54	38	34.6	27.1
Pasture Lodge Farm	331	402	15	11	2.0	1.5
Peene	79	76	15	0	8.8	0.0
Rucstalls	258	248	22	12	4.2	2.3
Runfold	232	502	48	2	6.1	0.3
Stonea	419	301	20	44	2.7	5.8
Tewkesbury	222	34	38	0	12.9	0.0
Thorpe Lea	113	97	16	4	7.1	1.9
Thruxton	89	47	15	9	9.9	6.2
Tort Hill East	50	78	21	16	14.1	11.1
Tort Hill West	78	183	55	11	17.4	4.0
Watkins Farm	278	100	138	40	26.7	9.6
Wavendon Gate	330	64	38	4	8.8	1.0
Weekley	479	368	45	30	5.0	3.4
West Stow	257	279	45	3	7.7	0.6
Whelford Bowmoor	165	34	8	1	3.9	0.5
Whitton	2185	2465	169	138	3.5	2.9
Winnall Down	831	831	227	80	12.0	4.6
Worth Maltravers, Compact Farm	34	160	4	6	2.0	3.0
			Mean Percentage		8.5	4.4
Early Roman: Rural - nucleated (n=24)						
Alcester	552	319	9	6	1.0	0.7
Alcester, AES 76-7	843	445	8	8	0.6	0.6
Asthall	160	242	8	11	2.0	2.7
Baldock	472	234	13	14	1.8	1.9
Braughing	471	808	39	10	3.0	0.8
Carlisle, The Lanes	869	1139	28	13	1.4	0.6
Castleford	2346	38	40	129	1.7	5.1
Catterick, Catterick Bridge	194	203	17	4	4.1	1.0
Chelmsford, site AA	176	556	6	3	0.8	0.4
Chelmsford, site S	543	59	16	10	2.6	1.6
Cirencester (Thawley)	85	1105	9	2	0.8	0.2
Conderton Camp	389	1590	36	6	1.8	0.3
Dragonby	672	80	61	29	7.5	3.7
Droitwich, Hanbury Street	93	462	10	2	1.8	0.4
Grandford	442	461	11	14	1.2	1.5
Hacheston	459	205	12	9	1.8	1.3
Neatham	120	172	2	8	0.7	2.7
Norbury Camp	85	143	1	2	0.4	0.9
Poundbury	630	2070	67	211	2.4	7.2
Shepton Mallet	394	283	36	13	5.0	1.9
Uffington White Horse	85	633	17	19	2.3	2.6
Wilcote	146	243	13	1	3.2	0.3
Worcester, Deansway	457	437	96	0	9.7	0.0
Worcester, Sidbury	382	82	209	2	31.1	0.4
			Mean Percentage		4.2	1.8
Early Roman: Urban (n=23)						
Caerleon, baths	84	254	0	5	0.0	1.5
Canterbury Castle	609	1164	123	59	6.5	3.2
Chichester, Cattlemarket	2879	1230	66	51	1.6	1.2
Chichester, Rowes Garage	166	31	7	5	3.4	2.5
Cirencester (Maltby)	3001	983	27	30	0.7	0.7

Site name	Cattle	Sheep/Goat	Horse	Dog	%Horse	%Dog
Early Roman: Urban (n=23) continued						
Colchester, Balkerne Heights	271	136	6	93	1.5	18.6
Colchester, Balkerne Lane	3488	1323	55	90	1.1	1.8
Colchester, Culver Street	626	579	10	0	0.8	0.0
Colchester, Gilberd School	500	445	5	0	0.5	0.0
Colchester, Sheepen	3107	1188	11	170	0.3	3.8
Dorchester, County Hall	308	688	6	7	0.6	0.7
Dorchester, County Hospital	131	189	2	2	0.6	0.6
Dorchester, Greyhound Yard	2685	2952	55	243	1.0	4.1
Dorchester, South Grove cottage	39	54	1	1	1.1	1.1
Exeter	1713	1070	80	8	2.8	0.3
Ilchester	289	242	21	122	3.8	18.7
Leicester, Little Lane	749	525	11	42	0.9	3.2
Lincoln	165	43	9	1	4.1	0.5
Silchester, defences	201	91	6	9	2.0	3.0
Silchester, forum basilica	1005	764	21	12	1.2	0.7
Southwark, Winchester Palace	81	63	2	28	1.4	16.3
Wroxeter, baths and macellum	799	442	2	38	0.2	3.0
York, General Accident site	5317	1493	34	60	0.5	0.9
			Mean Percentage		3.1	3.4
Early Roman: Military (n=19)						
Alchester	335	453	64	27	7.5	3.3
Birdoswald	472	288	23	30	2.9	3.8
Brancaster	1362	643	90	36	4.3	1.8
Caerleon, baths	633	108	1	0	0.1	0.0
Caerleon, scamnum tribunorum	362	112	1	7	0.2	1.5
Caernarfon	1280	340	35	31	2.1	1.9
Caistor-on-sea	116	6	1	4	0.8	3.2
Castleford	11069	4057	254	159	1.7	1.0
Cirencester (Thawley)	306	201	2	0	0.4	0.0
Colchester, Balkerne Lane	2905	720	78	225	2.1	5.8
Colchester, Culver Street	412	215	8	0	1.3	0.0
Colchester, Gilberd School	273	264	1	0	0.2	0.0
Droitwich, Dodderhill	141	74	2	1	0.9	0.5
Exeter	497	388	4	30	0.4	3.3
Hod Hill	151	459	7	0	1.1	0.0
Loughor	1834	546	9	10	0.4	0.4
Ribchester	1572	633	195	175	8.1	7.4
Wallsend	820	263	12	30	1.1	2.7
Wroxeter, fortress	1839	993	19	11	0.7	0.4
			Mean Percentage		1.9	2.9
Early Roman: Religious (n=8)						
Chelmsford, temple site	386	1289	34	24	2.0	1.4
Haddenham III, Snow's Farm	464	5081	43	13	0.8	0.2
Hayling Island	54	2717	8	1	0.3	0.0
Rocester	129	45	1	2	0.6	1.1
Slonk Hill	162	296	14	1	3.0	0.2
St Albans, Folly Lane	2491	218	131	141	4.6	4.9
Uley Shrines	1336	9749	11	109	0.1	1.0
Witham	975	100	51	10	4.5	0.9
			Mean Percentage		1.9	1.8
Late Roman: Rural - minor (n=59)						
Ashville Trading Estate	64	91	10	6	6.1	3.7
Avonmouth	66	135	15	8	6.9	3.8

Site name	Cattle	Sheep/Goat	Horse	Dog	%Horse	%Dog
Late Roman: Rural - minor (n=59) continued						
Balksbury Camp	299	383	101	13	12.9	1.9
Bancroft	2274	1367	281	81	7.2	2.2
Barnsley Park	3781	6529	548	142	5.0	1.4
Barton Court Farm	1906	975	387	136	11.8	4.5
Batten Hanger	461	196	69	17	9.5	2.5
Bignor	267	62	6	4	1.8	1.2
Castle Copse	164	318	35	0	6.8	0.0
Chapperton Down	348	362	104	14	12.8	1.9
Chignall	1576	399	176	35	8.2	1.7
Chilgrove 2	1739	664	286	366	10.6	13.2
Claydon Pike, Longdole's Field	1715	1253	286	25	8.8	0.8
Dalton Parlours	346	757	26	30	2.3	2.6
Dolland's Moor	51	42	15	1	13.9	1.1
Droitwich, Bays Meadow	1204	477	74	22	4.2	1.3
Duckpool	87	52	4	1	2.8	0.7
Elms Farm	874	96	63	22	6.1	2.2
Empingham North	46	141	4	0	2.1	0.0
Farmoor	204	106	31	2	9.1	0.6
Fishbourne, east (1995-2002)	36	38	1	2	1.3	2.6
Fishbourne, Harbour	105	61	26	1	13.5	0.6
Fishbourne, Palace (1960-68)	87	85	3	4	1.7	2.3
Fishbourne, Westward House	360	152	53	15	9.4	2.8
Frocester	3508	1822	553	190	9.4	3.4
Gorhambury	370	186	74	38	11.7	6.4
Great Holts Farm	93	8	5	0	4.7	0.0
Haddon	301	392	87	29	11.2	4.0
Houghton Down (Hammon)	103	274	36	8	8.7	2.1
Kelvedon	114	42	27	0	14.8	0.0
Keston	517	167	18	131	2.6	16.1
Kilverstone	112	85	39	81	16.5	29.1
Little Somborne	145	102	50	170	16.8	40.8
Minchin Hole Cave	25	243	0	0	0.0	0.0
Monk Sherborne	294	70	50	0	12.1	0.0
Newquay, Atlantic Road	112	500	5	2	0.8	0.3
North Shoebury	116	57	17	135	8.9	43.8
Orton Hall Farm	5868	2799	316	66	3.5	0.8
Orton Longueville	510	409	55	41	5.6	4.3
Owslebury	2473	3581	465	3731	7.1	38.1
Pasture Lodge farm	470	342	41	17	4.8	2.1
Portway	202	72	60	11	18.0	3.9
Poxwell	44	58	3	3	2.9	2.9
Ranscombe Hill	85	56	10	8	6.6	5.4
Renner's Park, well	129	36	122	0	42.5	0.0
Rucstalls	112	77	5	6	2.6	3.1
Shadwell	256	55	37	6	10.6	1.9
Shakenoak	1818	855	160	24	5.6	0.9
Stonea	1294	1279	48	22	1.8	0.8
Thorpe Lea	224	83	51	9	14.2	2.8
Tort Hill East	47	51	17	0	14.8	0.0
Wainscott	45	25	8	0	10.3	0.0
Watergate	288	92	19	4	4.8	1.0
Wavendon Gate	437	107	103	4	15.9	0.7
Wayside Farm	1072	86	100	6	7.9	0.5
Westhampnett	99	75	25	6	12.6	3.3
Whitcombe	129	190	16	15	4.8	4.5
Worplesdon	92	58	4	0	2.6	0.0
Yarford	147	220	14	11	3.7	2.9

Site name	Cattle	Sheep/Goat	Horse	Dog	%Horse	%Dog
Late Roman: Rural - minor (n=59) continued						
			Mean Percentage		9.2	6.8
Late Roman: Rural - nucleated (n=25)						
Alcester	6834	2335	23	311	0.3	3.3
Alcester, defences	1195	1166	16	7	0.7	0.3
Asthall	249	233	25	11	4.9	2.2
Baldock	119	67	12	23	6.1	11.0
Braughing	406	490	101	18	10.1	2.0
Carlisle, The Lanes	173	26	13	17	6.1	7.9
Castleford	2481	865	235	79	6.6	2.3
Catterick, Bainesse	3284	2143	0	0	0.0	0.0
Catterick, Catterick Bridge	639	257	95	15	9.6	1.6
Catterick, Thornbrough Farm	808	435	12	26	1.0	2.0
Chelmsford, site S	269	90	9	26	2.4	6.8
Chelmsford, site T	155	21	18	4	9.3	2.2
Coygan Camp	2907	807	40	13	1.1	0.3
Dragonby	305	382	58	19	7.8	2.7
Droitwich, Hanbury Street	94	39	6	2	4.3	1.5
Grandford	1078	2022	22	20	0.7	0.6
Great Dunmow	579	219	67	3	7.7	0.4
Hacheston	3705	1147	199	341	3.9	6.6
Kingscote	2377	2167	239	143	5.0	3.1
Neatham	950	318	70	118	5.2	8.5
Piercebridge	6725	2112	282	148	3.1	1.6
Poundbury	588	621	41	149	3.3	11.0
Wilcote	1197	2104	51	31	1.5	0.9
Worcester, Deansway	743	255	45	50	4.3	4.8
Worcester, Sidbury	1690	874	61	17	2.3	0.7
			Mean Percentage		4.7	3.4
Late Roman: Urban (n=21)						
Caerwent	386	103	112	509	18.6	51.0
Chichester, Cattlemarket	2994	1592	111	436	2.4	8.7
Chichester, Lavant Culvert	59	29	12	18	12.0	17.0
Cirencester (Maltby)	7409	2184	102	151	1.1	1.5
Colchester, Balkerne Lane	6099	1824	47	295	0.6	3.6
Colchester, Culver Street	781	567	17	0	1.2	0.0
Dorchester, County Hall	187	148	14	12	4.0	3.5
Dorchester, County Hospital	340	285	19	21	3.0	3.3
Dorchester, Greyhound Yard	3342	2906	50	225	0.8	3.5
Dorchester, South Grove cottage	69	50	6	1	4.8	0.8
Exeter	1838	700	39	53	1.5	2.0
Ilchester	516	126	34	70	5.0	9.8
Ilchester, Great Yard	201	229	20	1	4.4	0.2
Lincoln	4441	899	37	54	0.7	1.0
London, Walbrook Mithraeum	98	28	0	7	0.0	5.3
Silchester, defences	164	73	6	2	2.5	0.8
Silchester, forum-basilica	906	1479	21	15	0.9	0.6
Silchester, insula IX	1510	414	27	20	1.4	1.0
Southwark, Winchester Palace	77	11	2	120	2.2	57.7
Wroxeter, baths and macellum	3428	798	5	211	0.1	4.8
York, General Accident site	170	52	1	3	0.4	1.3
			Mean Percentage		3.4	7.3

Site name	Cattle	Sheep/Goat	Horse	Dog	%Horse	%Dog
Late Roman: Military (n=9)						
Birdoswald	632	211	**22**	**24**	**2.5**	**2.8**
Brancaster	53	66	**6**	**3**	**4.8**	**2.5**
Burgh Castle	312	54	**10**	**2**	**2.7**	**0.5**
Caerleon, baths	3742	568	**40**	**741**	**0.9**	**14.7**
Caernarfon	8388	643	**90**	**79**	**1.0**	**0.9**
Caistor-on-sea	2456	395	**44**	**65**	**1.5**	**2.2**
Carr Naze	175	437	**2**	**3**	**0.3**	**0.5**
Piercebridge, inner ditch	7767	2034	**535**	**335**	**5.2**	**3.3**
Portchester	10774	3212	**119**	**680**	**0.8**	**4.6**
			Mean Percentage		**2.4**	**5.5**
Late Roman: Religious (n=10)						
Bath	2092	1170	**14**	**60**	**0.4**	**1.8**
Brigstock	46	79	**0**	**0**	**0.0**	**0.0**
Chanctonbury Ring	332	570	**1**	**0**	**0.1**	**0.0**
Chelmsford, temple site	214	110	**8**	**7**	**2.4**	**2.1**
Great Dumnow	49	55	**4**	**0**	**3.7**	**0.0**
Henley Wood	30	138	**2**	**1**	**1.2**	**0.6**
Lowbury Hill	124	338	**6**	**3**	**1.3**	**0.6**
St Albans, Folly Lane	346	298	**184**	**45**	**22.2**	**6.5**
Uley Shrines	1773	37238	**9**	**251**	**0.0**	**0.6**
Witham	12037	2087	**2186**	**206**	**13.4**	**1.4**
			Mean Percentage		**2.8**	**4.6**

Appendix A.III; Main wild mammals by NISP and mean percentages by site type and phase

Site	Cattle	Sheep/ Goat	Red deer	Roe deer	Fallow deer	Hare	Fox	Badger	Mustelid
Middle Iron Age: Rural - minor (n=29)									
Appleford	198	99	79						
Ashville Trading Estate	366	727	1						
Aston Mill Farm	279	276							
Biddenham Loop	180	144	8						
Blackhorse Road	294	104				4			
Bramdean	277	498	1						
Brighton Hill	134	292	1						
Chilbolton Down	113	229							
Claydon Pike, Warrens Field	330	279							
Dolland's Moor	214	149							
Easton Lane	72	160							105
Eldon's Seat	140	305	3						
Farmoor	70	51							
Gravelly Guy	2910	4260	21	6					2
Groundwell Farm	556	1882	1	1		5	1		
Hawk's Hill	234	738							
Houghton Down (Hamilton)	779	1792		1			2		
Kingsmead South	167	244				1			
Market Deeping	138	151	1						
Micheldever Wood	836	1147	4			1	3		1
Old Down Farm	401	1046	13			1	20		
Owslebury	886	1004	6	6		1	4		
Rooksdown	324	653	4				3		
Slonk Hill	144	208							
Spratsgate Lane	322	272	1						
Suddern Farm	1267	2961	1				2		2
Thorpes Thewles	747	323	1				3		
Weekley	281	1327				1	3		
Winnall Down	838	1307	14			2			
	13497	**22628**	**160**	**14**	**0**	**16**	**41**	**0**	**110**
%presence						**0.9**			
Middle Iron Age: Rural - nucleated (n=8)									
Bury Hill	153	317					1		
Bury Wood Camp	124	235					1		
Conderton Camp	758	2165	1	1		2	1		
Danebury	7068	21283	190	7			114		
Dragonby	527	1029		1					
Maiden Castle	908	3009	3			1		1	
Uley Bury	131	181							
Winklebury Camp	759	1802	187	4		27	164	178	
	10428	**30021**	**381**	**13**	**0**	**30**	**281**	**179**	**0**
%presence						**2.1**			
Late Iron Age: Rural - minor (n=54)									
Abbeymead	49	105							
Ashville Trading Estate	290	334	1						
Balksbury Camp	1490	2606	16	4					1
Barton Court Farm	443	415	6			5	1		
Bicester Fields Farm	361	206	9	5					
Biddenham Loop	54	67	1						
Billingborough	964	757	7	6					
Birdlip	149	71		1					
Bishopstone	304	247	2	7			1		
Blackthorn	68	74							

Site	Cattle	Sheep/ Goat	Red deer	Roe deer	Fallow deer	Hare	Fox	Badger	Mustelid
Late Iron Age: Rural - minor (n=54) continued									
Brighton Hill	159	338	1						
Chignall	164	17							
Clay Lane	642	516	2						
Copse Farm	241	195							
Dalton Parlours	166	495							
Dolland's Moor	237	149							
Easton Lane	45	50							
Edix Hill	177	337	1			5	1		
Farningham Hill	221	148	4	5					
Fishbourne, east (1995-2002)	24	49	4	3		8			
Flagstones	471	954	1						
Frocester	630	364	10	10					
Gorhambury	81	39	1						
Grateley South	202	445							
Haddenham V	837	2446	19	2		3	3	5	1
Haddenham VI	86	232							
Hallen	797	1078	1						
Houghton Down (Hammon)	132	153							
Little Oakley	78	61							
Little Somborne	268	256	2						
Mingies Ditch	521	914	2						
Moulton Park	364	192	8						
Nettlebank Copse	938	1360	43			10	209		
North Bersted	259	203	1						
North Shoebury	33	67							
Orton Longueville	348	338				2			
Owslebury	1361	2688	10	5		24	1		15
Oxley Park West	104	67							
Rucstalls	233	470	2						
Runfold	420	201	6	1					
Slonk Hill	54	146	3						
Suddern Farm	690	711	10			26	89		
Thorpe Lea	96	61	1						
Thorpes Thewles	841	411	1				3		
Thruxton	53	49						2	
Tolpuddle Ball	110	191				1			
Tort Hill West	64	48							
Travelegue	192	96	12				1		
Wardy Hill	371	708	1			2	4	2	
Watkins Farm	405	429	2						
Wavendon Gate	413	79	1						
Weekley	1424	1266	1			3		1	
West Stow	1390	890	8	5			6		
Worth Maltravers, Compact Farm	453	1573		15		2	1		
	20967	**26362**	**200**	**69**	**0**	**91**	**320**	**10**	**17**
%presence						**1.5**			
Late Iron Age: Rural - nucleated (n=8)									
Cadbury Congresbury	604	134	11						1
Coygan Camp	381	101	24						
Danebury	417	716	8						
Dragonby	2273	4423		2		2			
Grimthorpe	403	184	19	5					
Silchester	1454	820							
Sutton Walls	863	752				13			
Uley Bury	175	215							

Site	Cattle	Sheep/ Goat	Red deer	Roe deer	Fallow deer	Hare	Fox	Badger	Mustelid
Late Iron Age: Rural - nucleated (n=8) continued									
	6570	**7345**	**62**	**7**	**0**	**15**	**0**	**0**	**1**
%presence						**0.6**			
Late Iron Age: Religious (n=4)									
Haddenham IV	65	53							
Uley Shrines	217	554							
Bancroft, temple-mausoleum	503	317	1			3	2		
Witham	899	467	63						
	1684	**1391**	**64**	**0**	**0**	**3**	**2**	**0**	**0**
%presence						**2.2**			
IA/RB transition: Rural - minor (n=35)									
Abbotstone Down	326	258	2					11	
Balksbury Camp	98	211	1						
Barton Court Farm	868	1072	22						
Birdlip	359	180		14					
Brighton Hill	948	721	11				1		1
Burgh	585	697	2			2	3		
Carne's Seat	85	117				17			
Claydon Pike, Longdole's Field	965	727	2						1
Copse Farm	538	205	1						
Easton Lane	120	68							
Elms Farm	780	216	1						
Fishbourne, Westward House	81	61	1	1					
Frocester	1415	2311	47	1		1			1
Gravelly Guy	1470	1878	1	1		1	1	4	
Haddon	38	36							
Houghton Down (Hamilton)	391	876							
Keston	24	220							
Lavant	75	55	3	1					
Martin	82	18							
Micheldever Wood	320	356	1				1		
Neigh Bridge	261	179		1					
Northwick	40	101							
Old Down Farm	153	223							
Orton Longueville	703	496	3			4			
Ounces Barn	114	27							
Owslebury	2758	3344	5			9	5		1
Rooksdown	112	224	1	1			6		
Suddern Farm	312	1289	3			1			
Tolpuddle Ball	180	499	2			6			
Twyford Down	43	203	2						
Wavendon Gate	611	174	17			1	9		
Whitcombe	492	1007							2
Winnall Down	69	70	1						
Woolbury	69	99					1		
Yarford	219	148	14	7		1			
	15704	**18366**	**143**	**27**	**0**	**43**	**27**	**15**	**6**
%presence						**0.8**			
IA/RB transition: Rural - nucleated (n=5)									
Braughing	1348	1546		2		2			
Ditches	2028	1644		5					
Silchester	1761	1302	2	2		4			
Silchester, defences	273	109							
Skeleton Green	786	449		1		1			

Site	Cattle	Sheep/ Goat	Red deer	Roe deer	Fallow deer	Hare	Fox	Badger	Mustelid
IA/RB transition: Rural - nucleated (n=5) continued									
	6196	**5050**	**2**	**10**	**0**	**7**	**0**	**0**	**0**
%presence						**0.2**			
IA/RB transition: Religious (n=3)									
Bancroft, temple-mausoleum	256	208					1		
Hayling Island	49	1407	4	7					
Uley Shrines	746	2261							
	1051	**3876**	**4**	**7**	**0**	**0**	**1**	**0**	**0**
%presence						**0.2**			
Early Roman: Rural - minor (n=59)									
Appleford	189	53	1						
Bancroft	117	81							
Barton Court Farm	178	98	1						
Biddenham Loop	189	159	3	1					
Billingborough	310	279							
Bishopstone	100	211	5						
Blackhorse Road	42	31					2		
Castle Copse	97	77	10	1		1			
Charlton Kings	232	176	2	1					
Chelmsford, mansio site AR	152	132							
Chignall	676	232							
Clay Lane	64	83				1			
Claydon Pike, Longdole's Field	1517	1340	13	4		9		2	
Cowbit	100	33	1					1	
Dolland's Moor	263	147							
Elms Farm	2904	689	12	1				1	
Elstead	464	305	3						
Empingham	163	961							
Fishbourne, east (1995-2002)	539	584	39	23	4	69	1		
Fishbourne, Palace (1960-68)	941	1070	167	107	18	54	2		
Frocester	2072	2240	56	1		1	1		
Fullerton	130	381	13	1		3	1		
Gorhambury	914	603	10	8		20			
Grateley South	258	484	4			3	3		
Haddon	260	314							
Haymes	307	258	4		2				
Hengistbury Head	433	29	4						
Houghton Down (Hammon)	37	56							
Kelvedon	140	75							
Kilverstone	85	89	2	1			1		
Little Oakley	178	81							
Little Somborne	116	221	1						18
Manor Farm	48	85							
Mount Roman villa	143	50							
Nash	1745	39							
Newhaven	181	119	5						
Newquay, Atlantic Road	146	595	1	1				1	1
Orton Hall Farm	1158	1350	5			5			
Orton Longueville	551	405	1			3			
Owslebury	515	620	3	4		1	3		1
Parnwell	66	36	1			1			
Pasture Lodge Farm	331	402		1		10	6		
Peene	79	76							
Rucstalls	258	248							
Runfold	232	82	2	4					
Tewkesbury	222	301				1			

Site	Cattle	Sheep/ Goat	Red deer	Roe deer	Fallow deer	Hare	Fox	Badger	Mustelid
Early Roman: Rural - minor (n=59)									
Thorpe Lea	113	34	1	1					
Thruxton	89	97	1	1			4	1	
Tort Hill East	50	47							
Tort Hill West	78	78							
Uffington White Horse	85	183	3	1			1		
Watkins Farm	278	100	3			2			
Wavendon Gate	330	64	1	2					
Weekley	479	368					1		
West Stow	257	279	2			8			
Whelford Bowmoor	165	34							
Whitton	2185	2465	106	75			4		
Winnall Down	831	831	3						
Worth Maltravers, Compact Farm	34	160	1	1					
	24816	**20720**	**490**	**240**	**24**	**192**	**30**	**6**	**20**
%presence						**2.2**			
Early Roman: Rural - nucleated (n=23)									
Alcester	552	319	1			1			
Alcester, AES 76-7	843	445				1		1	
Asthall	160	242							
Braughing	471	808							
Carlisle, The Lanes	869	299	9	3			4		
Castleford	13415	5196	42	24		15			
Catterick, Catterick Bridge	194	38				1			
Chelmsford, site AA	176	203		2		2			
Chelmsford, site S	543	556	1	2			2		
Cirencester (Thawley)	391	260		1					
Conderton Camp	389	1105	3	2		18	1		
Dragonby	672	1590	2	1			1		
Droitwich, Hanbury Street	93	80							
Grandford	442	923	1	4		3			
Hacheston	459	205	1						
Neatham	120	172	3						
Norbury Camp	85	143							
Poundbury	630	2070	23	217		3			
Shepton Mallet	394	283							
Wilcote	146	633		1					
Worcester, Deansway	457	243	1						
Worcester, Sidbury	382	437		5		6			
	21883	**16250**	**87**	**262**	**0**	**50**	**8**	**1**	**0**
%presence						**1.1**			
Early Roman: Urban (n=23)									
Canterbury Castle	609	1164	4	4		2			
Chichester, Cattlemarket	2879	1230	2	3		2			
Chichester, Rowes Garage	166	31					1		
Cirencester (Maltby)	3001	983	7	5		6			
Colchester, Balkerne Heights	271	136		2		3			
Colchester, Balkerne Lane	6393	2043	1	12		3			
Colchester, Culver Street	1038	794	37	53					
Colchester, Gilberd School	773	709	22	104					
Colchester, Sheepen	3107	1188	9	1		12			
Dorchester, County Hall	308	688		2					
Dorchester, County Hospital	131	189				3			
Dorchester, Greyhound Yard	2685	2952	6	5		24		2	
Dorchester, South Grove cottage	39	54							
Exeter	2210	1458	32	26		25	10		
Ilchester	289	242							

Site	Cattle	Sheep/ Goat	Red deer	Roe deer	Fallow deer	Hare	Fox	Badger	Mustelid
Early Roman: Urban (n=23) continued									
Leicester, Little Lane	749	525	5	1		7			
Lincoln	165	43	1						
Silchester, defences	201	91	3	2					
Silchester, forum-basilica	1005	764	4	2		10	4		
Southwark, Winchester Palace	81	63	18	16		30			
Wroxeter, baths and macellum	799	442	4	2		14	3		
York, General Accident site	5317	1493	11	13		23			
	32216	**17282**	**166**	**253**	**0**	**164**	**18**	**2**	**0**
%presence						**1.2**			
Early Roman: Military (n=14)									
Alchester	335	453				2	2		
Birdoswald	472	288	9	2		19			1
Brancaster	1362	643	2	2		1			
Caerleon, baths	717	362				6			
Caerleon, scamnum tribunorum	362	112	11	19		3			
Caernarfon	1280	340	94	46		2		1	
Caistor-on-sea	116	6	4	3			2	2	
Droitwich, Dodderhill	141	74				1			
Hod Hill	151	459	3			5			
Loughor	1834	546	60	63		21			
Ribchester	1572	633	10	15		4			
Stonea	419	502		1		2			
Wallsend	820	263	24	2					
Wroxeter, fortress	1839	993	62	23	1	3			
	11420	**5674**	**279**	**176**	**1**	**69**	**4**	**3**	**1**
%presence						**3.0**			
Early Roman: Religious (n=8)									
Hayling Island	54	2717	2						
Chelmsford, temple site	386	1289	1	1			1		
Haddenham III, Snow's Farm	464	5081	1						1
Rocester	129	45	1						
Slonk Hill	162	296	8			2			
St Albans, Folly Lane	2491	218	7						
Uley Shrines	1336	9749				2			
Witham	975	100	6	8					
	5997	**19495**	**26**	**9**	**0**	**4**	**1**	**0**	**1**
%presence						**0.2**			
Late Roman: Rural - minor (n=60)									
Ashville Trading Estate	64	91				1			
Avonmouth	66	135	2						
Balksbury Camp	299	383	5	1					
Bancroft	2274	1367	18	9		4			1
Barnsley Park	3781	6529	31	35	6	5	1	1	
Barton Court Farm	1906	975	31	2			1		
Batten Hanger	461	196	31	6					
Bignor	267	62	3						
Castle Copse	164	318	35	1		34	5	1	1
Chapperton Down	348	362	15						1
Chignall	1576	399	12	1					
Chilgrove 2	1739	664	11						
Claydon Pike, Longdole's Field	1715	1253	1	1			1	1	
Dalton Parlours	346	757	9			1			
Dolland's Moor	51	42	3						
Droitwich, Bays Meadow	1204	477	59						
Duckpool	87	52	7			1			

Site	Cattle	Sheep/ Goat	Red deer	Roe deer	Fallow deer	Hare	Fox	Badger	Mustelid
Late Roman: Rural - minor (n=60) continued									
Elms Farm	874	96	2	1		1			
Empingham North	31	64	1						
Empingham North, well	15	77							
Farmoor	204	106	4						
Fishbourne, east (1995-2002)	36	38	3		1				
Fishbourne, Harbour	105	61	9	3					
Fishbourne, Palace (1960-68)	87	85	7	10	1				
Fishbourne, Westward House	360	152	32	8	3			1	
Frocester	3508	1822	79	60		1	1		
Gorhambury	370	186	5	1		5			
Great Holts Farm	93	8	2			3			
Haddon	301	392							
Houghton Down (Hammon)	103	274	3			4			
Kelvedon	114	42							
Keston	517	167	17	3		1			
Kilverstone	112	85	5					23	
Little Somborne	145	102				8			
Minchin Hole Cave	25	70							
Monk Sherborne	294	243	2						
Newquay, Atlantic Road	112	500	2						
North Shoebury	116	57		1		1	24		
Orton Hall Farm	5868	2799	12			6			
Orton Longueville	510	409				1			
Owslebury	2473	3581	13	2		61	1	3	
Pasture Lodge Farm	470	342	1			9	12		3
Portway	202	72	7						
Poxwell	44	58		1					
Ranscombe Hill	85	56							
Renner's Park, well	129	36	2						
Rucstalls	112	77		1					
Shadwell	256	55							
Shakenoak	1818	855	380	82					
Stonea	1294	1279				2			
Thorpe Lea	224	83	6	1					
Tort Hill East	47	51							
Wainscott	45	25	1						
Watergate	288	92	32	16					
Wavendon Gate	437	107	3				1		
Wayside Farm	1072	86	1				2		
Westhampnett	99	75				1			
Whitcombe	129	190							
Worplesdon	92	58	4	4		1			
Yarford	147	220	16	5		3			
	39711	**29295**	**924**	**255**	**11**	**154**	**49**	**30**	**6**
%presence						**2.0**			
Late Roman: Rural - nucleated (n=26)									
Alcester	6834	2335	15	2		18		3	
Alcester, defences	1195	1166	3	2		5			
Asthall	249	233							
Baldock	119	67	6	1		2	1		
Braughing	406	490	1						
Carlisle, The Lanes	173	26	5	1					
Castleford	2481	865	30	4		10			
Catterick, Bainesse	3284	2143	4						
Catterick, Catterick Bridge	639	257	5						
Catterick, Thornbrough Farm	808	435				2			

Site	Cattle	Sheep/ Goat	Red deer	Roe deer	Fallow deer	Hare	Fox	Badger	Mustelid
Late Roman: Rural - nucleated (n=26) continued									
Chelmsford, site S	269	90	3						
Chelmsford, site T	155	21				1			
Coygan Camp	2907	807	55	2		3			
Dragonby	305	382				1			
Droitwich, Hanbury Street	94	39							
Grandford	1078	2022	1	7	1				
Great Dumnow	628	274	4						
Hacheston	3705	1147	15	3		60	8	4	
Kingscote	2377	2167	85	15		1	1	21	1
Neatham	950	318	26	1		1			
Piercebridge, large vicus building	2075	890	11	1		70	1	1	
Piercebridge, outer ditch	4650	1222	8			6	2		
Poundbury	588	621		56		1			
Wilcote	1197	2104	6	5		1			
Worcester, Deansway	743	255	3	1					
Worcester, Sidbury	1690	874	1	2		2			
	39599	**21250**	**287**	**103**	**1**	**184**	**13**	**29**	**1**
%presence						**1.0**			
Late Roman: Urban (n=21)									
Caerwent	386	103	16	2		7			
Chichester, Cattlemarket	2994	1592	18	6		8			
Chichester, Lavant Culvert	59	29		1	1				
Cirencester (Maltby)	7409	2184	28	10		25		2	
Colchester, Balkerne Lane	6099	1824	38	14		1			
Colchester, Culver Street	781	567	39	53					
Dorchester, County Hall	187	148							
Dorchester, County Hospital	340	285	2			2			
Dorchester, Greyhound Yard	3342	2906	39	28		40		6	
Dorchester, South Grove cottage	69	50			1				
Exeter	1838	700	11	9		38	4	42	
Ilchester	516	126							
Ilchester, Great Yard	201	229	4			2			
Lincoln	4441	899	15	2		6	8	2	
London, Walbrook Mithraeum	98	28	1			1			
Silchester, defences	164	73	7	1		1			
Silchester, forum-basilica	906	1479	3	2		27			
Silchester, insula IX	1510	414	11	9		7			2
Southwark, Winchester Palace	77	11	2			5			
Wroxeter, baths and macellum	3428	798	5	4	1	6			
York, General Accident site	170	52							
	35015	**14497**	**239**	**141**	**3**	**176**	**12**	**52**	**2**
%presence						**1.2**			
Late Roman: Military (n=9)									
Birdoswald	632	211	8						
Brancaster	53	66							
Burgh Castle	312	54	153	8					
Caerleon, baths	3742	568	24	1		3			
Caernarfon	8388	643	282	13		1		1	
Caistor-on-sea	2456	395	132	46		81	37	15	
Carr Naze	175	437	7	1		1		2	1
Piercebridge, inner ditch	7767	2034	218			9	24	7	
Portchester	10774	3212	262	49		22	22	13	
	34299	**7620**	**1086**	**118**	**0**	**117**	**83**	**38**	**1**
%presence						**3.3**			

Site	Cattle	Sheep/ Goat	Red deer	Roe deer	Fallow deer	Hare	Fox	Badger	Mustelid
Late Roman: Religious (n=9)									
Bath	2092	1170	4	2		13			
Brigstock	46	79	2						
Chanctonbury Ring	332	248	11						
Chelmsford, temple site	214	110					1		
Henley Wood	30	138	5		5	3			
Lowbury Hill	124	338							
St Albans, Folly Lane	346	298	12			1			
Uley Shrines	1773	37238		1		7			2
Witham	12047	2087	152	23		5			
	17004	**41706**	**186**	**26**	**5**	**29**	**1**	**0**	**2**
%presence						**0.4**			

Appendix A.IV; Bird NISP and relative frequencies by avian group by site type and date (DF = domestic fowl; WTL = wetland bird; WF = other wildfowl).

Site	Cattle	Sheep/ Goat	domestic fowl	%DF	wetland bird	%WTL bird	other wildfowl	%other WF
Middle Iron Age: Rural - minor (n=29)								
Appleford	198	99		0.0		0.0		0.0
Ashville Trading Estate	366	727		0.0	6	0.5	1	0.1
Aston Mill Farm	279	276		0.0		0.0		0.0
Biddenham Loop	180	144		0.0		0.0		0.0
Blackhorse Road	294	104		0.0		0.0	1	0.3
Bramdean	277	498		0.0		0.0		0.0
Brighton Hill	134	292		0.0		0.0		0.0
Chilbolton Down	113	229		0.0		0.0		0.0
Claydon Pike, Warrens Field	330	279		0.0		0.0	1	0.2
Dolland's Moor	214	149		0.0		0.0		0.0
Easton Lane	72	160		0.0		0.0	1	0.4
Eldon's Seat	140	305		0.0		0.0		0.0
Farmoor	70	51		0.0		0.0		0.0
Gravelly Guy	2910	4260	10	0.1	11	0.2	6	0.1
Groundwell Farm	556	1882		0.0	2	0.1	6	0.2
Hawk's Hill	234	738		0.0		0.0		0.0
Houghton Down (Hamilton)	779	1792	95	3.6	3	0.1	24	0.9
Kingsmead South	167	244		0.0		0.0		0.0
Market Deeping	138	151		0.0	4	1.4		0.0
Micheldever Wood	836	1147	4	0.2	4	0.2	1	0.1
Old Down Farm	401	1046		0.0		0.0	2	0.1
Owslebury	886	1004		0.0		0.0	26	1.4
Rooksdown	324	653		0.0		0.0	77	7.3
Slonk Hill	144	208	1	0.3		0.0		0.0
Spratsgate Lane	322	272		0.0		0.0		0.0
Suddern Farm	1267	2961		0.0	2	0.0	5	0.1
Thorpes Thewles	747	323		0.0	2	0.2		0.0
Weekley	281	1327		0.0	1	0.1		0.0
Winnall Down	838	1307		0.0	8	0.4	8	0.4
MEAN PERCENTAGE				0.1		0.1		0.4
Middle Iron Age: Rural - nucleated (n=8)								
Bury Hill	153	317		0.0	2	0.4	1	0.2
Bury Wood Camp	124	235	3	0.8	3	0.8		0.0
Conderton Camp	758	2165		0.0	3	0.1	6	0.2
Danebury	7068	21283	5	0.0	39	0.1	226	0.8
Dragonby	527	1029	3	0.2	1	0.1	16	1.0
Maiden Castle	908	3009		0.0		0.0		0.0
Uley Bury	131	181		0.0		0.0		0.0
Winklebury Camp	759	1802	49	1.9		0.0	27	1.0
MEAN PERCENTAGE				0.4		0.2		0.4
Late Iron Age: Rural - minor (n=54)								
Abbeymead	49	105		0.0		0.0		0.0
Ashville Trading Estate	290	334	1	0.2	4	0.6		0.0
Balksbury Camp	1490	2606		0.0	15	0.4	15	0.4
Barton Court Farm	443	415	3	0.3	1	0.1	3	0.3
Bicester Fields Farm	361	206		0.0		0.0		0.0
Biddenham Loop	54	67		0.0		0.0		0.0
Billingborough	964	757		0.0	19	1.1	4	0.2

Site	Cattle	Sheep/ Goat	domestic fowl	%DF	wetland bird	%WTL bird	other wildfowl	%other WF
Late Iron Age: Rural - minor (n=54) continued								
Birdlip	149	71		0.0		0.0		0.0
Bishopstone	304	247	1	0.2	2	0.4		0.0
Blackthorn	68	74		0.0		0.0		0.0
Brighton Hill	159	338	3	0.6	1	0.2		0.0
Chignall	164	17		0.0		0.0		0.0
Clay Lane	642	516		0.0		0.0		0.0
Copse Farm	241	195		0.0		0.0	2	0.5
Dalton Parlours	166	495		0.0		0.0		0.0
Dolland's Moor	237	149		0.0		0.0		0.0
Easton Lane	45	50		0.0		0.0		0.0
Edix Hill	177	337		0.0		0.0		0.0
Farningham Hill	221	148		0.0		0.0		0.0
Fishbourne, east (1995-2002)	24	49	8	9.9	5	6.4		0.0
Flagstones	471	954		0.0	1	0.1		0.0
Frocester	630	364		0.0		0.0		0.0
Gorhambury	81	39		0.0		0.0	2	1.6
Grateley South	202	445	29	4.3		0.0	7	1.1
Haddenham V	837	2446		0.0	536	14.0	1	0.0
Haddenham VI	86	232		0.0	6	1.9		0.0
Hallen	797	1078		0.0	1	0.1		0.0
Houghton Down (Hammon)	132	153		0.0		0.0		0.0
Little Oakley	78	61	2	1.4		0.0		0.0
Little Somborne	268	256		0.0		0.0	1	0.2
Mingies Ditch	521	914	1	0.1	2	0.1	2	0.1
Moulton Park	364	192		0.0		0.0		0.0
Nettlebank Copse	938	1360	2	0.1		0.0	23	1.0
North Bersted	259	203		0.0		0.0		0.0
North Shoebury	33	67		0.0	1	1.0		0.0
Orton Longueville	348	338		0.0		0.0		0.0
Owslebury	1361	2688	14	0.3		0.0	19	0.5
Oxley Park West	104	67		0.0		0.0		0.0
Rucstalls	233	470		0.0		0.0		0.0
Runfold	420	201		0.0		0.0		0.0
Suddern Farm	690	711	4	0.3	2	0.1	34	2.4
Thorpe Lea	96	61		0.0		0.0		0.0
Thorpes Thewles	841	411	1	0.1		0.0		0.0
Thruxton	53	49		0.0	1	1.0		0.0
Tolpuddle Ball	110	191		0.0		0.0		0.0
Tort Hill West	64	48		0.0		0.0		0.0
Travelegue	192	96		0.0		0.0		0.0
Wardy Hill	371	708	5	0.5	17	1.6	7	0.6
Watkins Farm	405	429		0.0		0.0		0.0
Weekley	1424	1266		0.0	2	0.1	2	0.1
West Stow	1390	890	6	0.3	9	0.4		0.0
Worth Maltravers, Compact Farm	453	1573		0.0	2	0.1		0.0
MEAN PERCENTAGE				0.4		0.6		0.2
Late Iron Age: Rural - nucleated (n=8)								
Cadbury Congresbury	604	134		0.0		0.0		0.0
Coygan Camp	381	101		0.0		0.0		0.0
Danebury	417	716		0.0	1	0.1	4	0.4
Dragonby	2273	4423	21	0.3	2	0.0	139	2.0
Grimthorpe	403	184		0.0		0.0		0.0

Site	Cattle	Sheep/ Goat	domestic fowl	%DF	wetland bird	%WTL bird	other wildfowl	%other WF
Late Iron Age: Rural - nucleated (n=8) continued								
Silchester	1454	820	13	0.6	7	0.3	3	0.1
Sutton Walls	863	752		0.0		0.0		0.0
Uley Bury	175	215		0.0		0.0		0.0
MEAN PERCENTAGE				0.1		0.1		0.3
Late Iron Age: Religious (n=4)								
Bancroft, temple-mausoleum	503	317		0.0		0.0		0.0
Haddenham IV	65	53		0.0	3	2.5		0.0
Uley Shrines	217	554	7	0.9		0.0		0.0
Witham	899	467	4	0.3		0.0		0.0
MEAN PERCENTAGE				0.3		0.6		0.0
IA/RB transition: Rural - minor (n=35)								
Abbotstone Down	326	258	2	0.3		0.0		0.0
Barton Court Farm	868	1072		0.0		0.0		0.0
Birdlip	359	180		0.0		0.0		0.0
Brighton Hill	948	721	1	0.1		0.0	1	0.1
Burgh	585	697		0.0	5	0.4	4	0.3
Carne's Seat	85	117		0.0	1	0.5		0.0
Claydon Pike, Longdole's Field	965	727	14	0.8	9	0.5	5	0.3
Copse Farm	538	205		0.0		0.0	1	0.1
Easton Lane	120	68		0.0		0.0		0.0
Elms Farm	780	216		0.0		0.0		0.0
Fishbourne, Westward House	81	61		0.0		0.0		0.0
Frocester	1415	2311	8	0.2		0.0	1	0.0
Gravelly Guy	1470	1878	4	0.1	14	0.4	1	0.0
Haddon	38	36		0.0		0.0		0.0
Houghton Down (Hamilton)	391	876	4	0.3	1	0.1	1	0.1
Keston	24	220		0.0		0.0		0.0
Lavant	75	55		0.0		0.0		0.0
Martin	82	18		0.0		0.0		0.0
Micheldever Wood	320	356		0.0		0.0		0.0
Neigh Bridge	261	179	1	0.2		0.0		0.0
Northwick	40	101		0.0		0.0		0.0
Old Down Farm	153	223	1	0.3	3	0.8		0.0
Orton Longueville	703	496		0.0		0.0		0.0
Ounces Barn	114	27		0.0		0.0		0.0
Owslebury	2758	3344	17	0.3	3	0.0	82	1.3
Rooksdown	112	224		0.0	3	0.9	1	0.3
Suddern Farm	312	1289	2	0.1		0.0	1	0.1
Tolpuddle Ball	180	499		0.0		0.0		0.0
Twyford Down	43	203		0.0		0.0		0.0
Wavendon Gate	611	174	43	5.2		0.0		0.0
Whitcombe	492	1007		0.0		0.0		0.0
Winnall Down	69	70		0.0		0.0		0.0
Woolbury	69	99		0.0		0.0		0.0
Yarford	219	148	8	2.1		0.0		0.0
MEAN PERCENTAGE				0.3		0.1		0.1
IA/RB transition: Rural - nucleated (n=5)								
Braughing	1348	1546		0.0		0.0		0.0
Ditches	2028	1644	9	0.2	2	0.1	1	0.0

Site	Cattle	Sheep/ Goat	domestic fowl	%DF	wetland bird	%WTL bird	other wildfowl	%other WF
IA/RB transition: Rural - nucleated (n=5) continued								
Silchester	1761	1302	128	4.0	16	0.5	33	1.1
Silchester, defences	273	109	1	0.3		0.0	2	0.5
Skeleton Green	786	449	137	10.0	5	0.4	35	2.8
MEAN PERCENTAGE				2.9		0.2		0.9
IA/RB transition: Religious (n=3)								
Bancroft, temple-mausoleum	256	208		0.0		0.0		0.0
Hayling Island	49	1407		0.0		0.0		0.0
Uley Shrines	746	2261	8	0.3	1	0.0	1	0.0
MEAN PERCENTAGE				0.1		0.0		0.0
Early Roman: Rural - minor (n=59)								
Appleford	189	53	1	0.4		0.0		0.0
Bancroft	117	81	1	0.5	2	1.0		0.0
Barton Court Farm	178	98	3	1.1	1	0.4	1	0.4
Biddenham Loop	189	159	3	0.9	1	0.3		0.0
Billingborough	310	279	73	11.0		0.0		0.0
Bishopstone	100	211		0.0		0.0		0.0
Blackhorse Road	42	31		0.0		0.0	1	1.4
Castle Copse	97	77	19	9.8	11	5.9	5	2.8
Charlton Kings	232	176	4	1.0	1	0.2		0.0
Chelmsford, mansio site AR	152	132	4	1.4		0.0		0.0
Chignall	676	232	5	0.5	2	0.2		0.0
Clay Lane	64	83	4	2.6		0.0		0.0
Claydon Pike, Longdole's Field	1517	1340	57	2.0	26	0.9	6	0.2
Cowbit	100	33		0.0		0.0		0.0
Dolland's Moor	263	147		0.0		0.0		0.0
Elms Farm	2904	689	56	1.5	13	0.4	4	0.1
Elstead	464	305		0.0		0.0		0.0
Empingham	163	961	60	5.1	5	0.4	6	0.5
Fishbourne, east (1995-2002)	539	584	144	11.4	60	5.1	13	1.1
Fishbourne, Palace (1960-68)	941	1070	610	23.3	137	6.4	8	0.4
Frocester	2072	2240	27	0.6	6	0.1	1	0.0
Fullerton	130	381	62	10.8	5	1.0	9	1.7
Gorhambury	914	603	56	3.6	44	2.8	1	0.1
Grateley South	258	484	17	2.2	1	0.1	4	0.5
Haddon	260	314		0.0	6	1.0	5	0.9
Haymes	307	258		0.0		0.0		0.0
Hengistbury Head	433	29		0.0		0.0		0.0
Houghton Down (Hammon)	37	56	1	1.1		0.0		0.0
Kelvedon	140	75		0.0		0.0		0.0
Kilverstone	85	89		0.0		0.0		0.0
Little Oakley	178	81	5	1.9		0.0		0.0
Little Somborne	116	221	2	0.6		0.0	5	1.5
Manor Farm	48	85	1	0.7		0.0		0.0
Mount Roman villa	143	50		0.0		0.0		0.0
Nash	1745	39		0.0		0.0		0.0
Newhaven	181	119		0.0		0.0		0.0
Newquay, Atlantic Road	146	595		0.0	6	0.8	1	0.1
Orton Hall Farm	1158	1350	5	0.2	5	0.2	4	0.2
Orton Longueville	551	405		0.0		0.0		0.0
Owslebury	515	620	6	0.5		0.0	59	4.9
Parnwell	66	36	2	1.9	3	2.9	1	1.0

Site	Cattle	Sheep/ Goat	domestic fowl	%DF	wetland bird	%WTL bird	other wildfowl	%other WF
Early Roman: Rural - minor (n=59) continued								
Pasture Lodge Farm	331	402	18	2.4	13	1.7	4	0.5
Peene	79	76		0.0		0.0		0.0
Rucstalls	258	248		0.0		0.0		0.0
Runfold	232	82		0.0		0.0		0.0
Tewkesbury	222	301	1	0.2		0.0		0.0
Thorpe Lea	113	34		0.0		0.0		0.0
Thruxton	89	97	9	4.6		0.0		0.0
Tort Hill East	50	47		0.0		0.0	1	1.0
Tort Hill West	78	78		0.0		0.0		0.0
Watkins Farm	278	100		0.0		0.0		0.0
Wavendon Gate	330	64	21	5.1	3	0.8		0.0
Weekley	479	368		0.0	2	0.2		0.0
West Stow	257	279	2	0.4	3	0.6		0.0
Whelford Bowmoor	165	34		0.0		0.0		0.0
Whitton	2185	2465		0.0		0.0		0.0
Winnall Down	831	831	2	0.1		0.0	2	0.1
Worth Maltravers, Compact Farm	34	160	1	0.5	1	0.5		0.0
MEAN PERCENTAGE				1.9		0.6		0.3
Early Roman: Rural - nucleated (n=23)								
Alcester	552	319	23	2.6	1	0.1		0.0
Alcester, AES 76-7	843	445	27	2.1	2	0.2	6	0.5
Asthall	160	242	2	0.5	1	0.2	2	0.5
Braughing	471	808		0.0		0.0		0.0
Carlisle, The Lanes	869	299	7	0.6	7	0.6	1	0.1
Castleford	13415	5196		0.0		0.0		0.0
Catterick, Catterick Bridge	194	38	1	0.4		0.0		0.0
Chelmsford, site AA	176	203		0.0		0.0		0.0
Chelmsford, site S	543	556		0.0		0.0		0.0
Cirencester (Thawley)	391	260		0.0		0.0		0.0
Conderton Camp	389	1105	1	0.1		0.0	1	0.1
Dragonby	672	1590	26	1.1	4	0.2	23	1.0
Droitwich, Hanbury Street	93	80	8	4.4		0.0		0.0
Grandford	442	923	19	1.4	5	0.4	1	0.1
Hacheston	459	205		0.0		0.0		0.0
Neatham	120	172	13	4.3		0.0		0.0
Norbury Camp	85	143		0.0		0.0		0.0
Poundbury	630	2070		0.0		0.0		0.0
Shepton Mallet	394	283	14	2.0	1	0.1	1	0.1
Wilcote	146	633		0.0		0.0		0.0
Worcester, Deansway	457	243	8	1.1	5	0.7	1	0.1
Worcester, Sidbury	382	437	10	1.2	2	0.2		0.0
MEAN PERCENTAGE				1.0		0.1		0.1
Early Roman: Urban (n=23)								
Canterbury Castle	609	1164		0.0		0.0		0.0
Chichester, Cattlemarket	2879	1230	42	1.0	12	0.3	14	0.3
Chichester, Rowes Garage	166	31		0.0		0.0		0.0
Cirencester (Maltby)	3001	983	116	2.8	30	0.7	4	0.1
Colchester, Balkerne Heights	271	136	17	4.0	9	2.2	1	0.2
Colchester, Balkerne Lane	6393	2043	86	1.0	10	0.1		0.0
Colchester, Culver Street	1038	794	353	16.2	72	3.8		0.0
Colchester, Gilberd School	773	709	597	28.7	128	8.0		0.0

Site	Cattle	Sheep/ Goat	domestic fowl	%DF	wetland bird	%WTL bird	other wildfowl	%other WF
Early Roman: Urban (n=23) continued								
Colchester, Sheepen	3107	1188	142	3.2	29	0.7	48	1.1
Dorchester, County Hall	308	688	2	0.2	4	0.4	2	0.2
Dorchester, County Hospital	131	189	102	24.2	8	2.4	2	0.6
Dorchester, Greyhound Yard	2685	2952	564	9.1	147	2.5	342	5.7
Dorchester, South Grove cottage	39	54	2	2.1		0.0		0.0
Exeter	2210	1458	123	3.2	17	0.5	19	0.5
Ilchester	289	242	57	9.7	25	4.5		0.0
Leicester, Little Lane	749	525	96	7.0	15	1.2	16	1.2
Lincoln	165	43	10	4.6	1	0.5		0.0
Silchester, defences	201	91	4	1.4		0.0		0.0
Silchester, forum-basilica	1005	764	95	5.1	18	1.0	8	0.5
Southwark, Winchester Palace	81	63		0.0		0.0		0.0
Wroxeter, baths and macellum	799	442	95	7.1	25	2.0	3	0.2
York, General Accident site	5317	1493	573	7.8	180	2.6	1	0.0
MEAN PERCENTAGE				6.3		1.5		0.5
Early Roman: Military (n=14)								
Alchester	335	453	12	1.5	4	0.5		0.0
Birdoswald	472	288	5	0.7	1	0.1	8	1.0
Brancaster	1362	643	15	0.7	7	0.3	16	0.8
Caerleon, baths	717	362	685	38.8	15	1.4		0.0
Caerleon, scamnum tribunorum	362	112	95	16.7	109	18.7	3	0.6
Caistor-on-sea	116	6	8	6.2	3	2.4	2	1.6
Droitwich, Dodderhill	141	74	3	1.4		0.0		0.0
Hod Hill	151	459	1	0.2	2	0.3	1	0.2
Loughor	1834	546	146	5.8	33	1.4	4	0.2
Ribchester	1572	633	18	0.8	5	0.2	18	0.8
Wallsend	820	263	13	1.2	6	0.6	2	0.2
Wroxeter, fortress	1839	993	104	3.5	30	1.0	11	0.4
MEAN PERCENTAGE				6.5		2.2		0.5
Early Roman: Religious (n=8)								
Chelmsford, temple site	386	1289	81	4.6	4	0.2		0.0
Haddenham III, Snow's Farm	464	5081	1	0.0	6	0.1	4	0.1
Hayling Island	54	2717		0.0		0.0		0.0
Rocester	129	45	3	1.7		0.0		0.0
Slonk Hill	162	296	4	0.9		0.0		0.0
St Albans, Folly Lane	2491	218	21	0.8	3	0.1	8	0.3
Uley Shrines	1336	9749	644	5.5	10	0.1	6	0.1
Witham	975	100	1	0.1		0.0		0.0
MEAN PERCENTAGE				1.7		0.1		0.1
Late Roman: Rural - minor (n=60)								
Ashville Trading Estate	64	91	9	5.5		0.0		0.0
Avonmouth	66	135	1	0.5		0.0	1	0.5
Bancroft	2274	1367	112	3.0	77	2.1	5	0.1
Barnsley Park	3781	6529	31	0.3	61	0.6	2	0.0
Barton Court Farm	1906	975	91	3.1	28	1.0	14	0.5
Batten Hanger	461	196		0.0		0.0		0.0
Bignor	267	62	4	1.2		0.0		0.0
Castle Copse	164	318	869	64.3	286	37.2	3	0.6
Chapperton Down	348	362	2	0.3	1	0.1		0.0

Site	Cattle	Sheep/ Goat	domestic fowl	%DF	wetland bird	%WTL bird	other wildfowl	%other WF
Late Roman: Rural - minor (n=60) continued								
Chignall	1576	399	19	1.0	1	0.1		0.0
Chilgrove 2	1739	664		0.0		0.0		0.0
Claydon Pike, Longdole's Field	1715	1253	80	2.6	54	1.8	6	0.2
Dalton Parlours	346	757		0.0		0.0		0.0
Dolland's Moor	51	42		0.0		0.0		0.0
Droitwich, Bays Meadow	1204	477	114	6.4	61	3.5	34	2.0
Duckpool	87	52		0.0		0.0		0.0
Elms Farm	874	96	17	1.7	22	2.2	4	0.4
Empingham North	31	64	16	14.4	4	4.0	3	3.1
Empingham North, well	15	77	9	8.9	13	12.4	2	2.1
Farmoor	204	106		0.0		0.0	1	0.3
Fishbourne, east (1995-2002)	36	38	6	7.5	5	6.3	1	1.3
Fishbourne, Harbour	105	61		0.0		0.0		0.0
Fishbourne, Palace (1960-68)	87	85	15	8.0	7	3.9		0.0
Fishbourne, Westward House	360	152	9	1.7		0.0		0.0
Frocester	3508	1822	95	1.8	20	0.4	2	0.0
Gorhambury	370	186	11	1.9	3	0.5	5	0.9
Great Holts Farm	93	8	20	16.5	38	27.3	131	56.5
Haddon	301	392		0.0		0.0		0.0
Houghton Down (Hammon)	103	274	11	2.8		0.0		0.0
Kelvedon	114	42		0.0		0.0		0.0
Keston	517	167		0.0		0.0		0.0
Kilverstone	112	85	3	1.5		0.0		0.0
Little Somborne	145	102	19	7.1		0.0	52	17.4
Minchin Hole Cave	25	70		0.0		0.0		0.0
Monk Sherborne	294	243	34	6.0		0.0	4	0.7
Newquay, Atlantic Road	112	500		0.0	1	0.2		0.0
North Shoebury	116	57	11	6.0	2	1.1	2	1.1
Orton Hall Farm	5868	2799	30	0.3	10	0.1	3	0.0
Orton Longueville	510	409		0.0		0.0		0.0
Owslebury	2473	3581	269	4.3	6	0.1	177	2.8
Pasture Lodge Farm	470	342	81	9.1	24	2.9	1	0.1
Portway	202	72		0.0		0.0		0.0
Poxwell	44	58		0.0	1	1.0		0.0
Ranscombe Hill	85	56		0.0		0.0		0.0
Renner's Park, well	129	36		0.0		0.0		0.0
Rucstalls	112	77		0.0		0.0		0.0
Shadwell	256	55	18	5.5	3	1.0		0.0
Shakenoak	1818	855		0.0		0.0		0.0
Stonea	1294	1279	8	0.3		0.0		0.0
Thorpe Lea	224	83		0.0		0.0		0.0
Tort Hill East	47	51	1	1.0		0.0		0.0
Wainscott	45	25		0.0		0.0		0.0
Watergate	288	92		0.0		0.0		0.0
Wavendon Gate	437	107	1	0.2	1	0.2	1	0.2
Wayside Farm	1072	86		0.0		0.0		0.0
Whitcombe	129	190		0.0		0.0		0.0
Worplesdon	92	58	1	0.7		0.0		0.0
Yarford	147	220	71	16.2	16	4.2	3	0.8
MEAN PERCENTAGE				3.6		2.0		1.6
Late Roman: Rural - nucleated (n=26)								
Alcester	6834	2335	247	2.6	47	0.5	32	0.3
Alcester, defences	1195	1166	142	5.7	6	0.3	9	0.4

Site	Cattle	Sheep/ Goat	domestic fowl	%DF	wetland bird	%WTL bird	other wildfowl	%other WF
Late Roman: Rural - nucleated (n=26) continued								
Asthall	249	233	2	0.4	1	0.2	4	0.8
Baldock	119	67		0.0		0.0		0.0
Braughing	406	490		0.0		0.0		0.0
Carlisle, The Lanes	173	26	12	5.7	1	0.5	11	5.2
Catterick, Bainesse	3284	2143	1	0.0	3	0.1	5	0.1
Catterick, Catterick Bridge	639	257		0.0		0.0		0.0
Catterick, Thornbrough Farm	808	435	33	2.6	1	0.1	5	0.4
Chelmsford, site S	269	90		0.0		0.0		0.0
Chelmsford, site T	155	21	1	0.6		0.0		0.0
Coygan Camp	2907	807	2	0.1	1	0.0		0.0
Dragonby	305	382	36	5.0	7	1.0	47	6.4
Droitwich, Hanbury Street	94	39	7	5.0	2	1.5	1	0.7
Grandford	1078	2022	13	0.4	6	0.2	4	0.1
Great Dumnow	628	274	4	0.4		0.0		0.0
Hacheston	3705	1147	26	0.5	4	0.1	1	0.0
Kingscote	2377	2167	2	0.0		0.0	1	0.0
Neatham	950	318	48	3.6	4	0.3		0.0
Piercebridge, large vicus building	2075	890	114	3.7	76	2.5	2	0.1
Piercebridge, outer ditch	4650	1222	98	1.6	27	0.5	18	0.3
Poundbury	588	621		0.0		0.0		0.0
Worcester, Deansway	743	255	7	0.7	2	0.2	1	0.1
Worcester, Sidbury	1690	874	10	0.4	4	0.2	2	0.1
MEAN PERCENTAGE				1.6		0.3		0.6
Late Roman: Urban (n=21)								
Caerwent	386	103	29	5.6	9	1.8	1	0.2
Chichester, Cattlemarket	2994	1592	90	1.9	20	0.4	12	0.3
Chichester, Lavant Culvert	59	29		0.0		0.0		0.0
Cirencester (Maltby)	7409	2184	305	3.1	89	0.9	15	0.2
Colchester, Balkerne Lane	6099	1824	388	4.7	107	1.3		0.0
Colchester, Culver Street	781	567	586	30.3	188	12.2		0.0
Dorchester, County Hall	187	148	1	0.3	2	0.6	1	0.3
Dorchester, County Hospital	340	285		0.0		0.0		0.0
Dorchester, Greyhound Yard	3342	2906	704	10.1	224	3.5	13	0.2
Dorchester, South Grove cottage	69	50	6	4.8		0.0		0.0
Exeter	1838	700	207	7.5	49	1.9	18	0.7
Ilchester	516	126	299	31.8	69	9.7		0.0
Ilchester, Great Yard	201	229	11	2.5		0.0		0.0
Lincoln	4441	899	38	0.7	74	1.4	4	0.1
London, Walbrook Mithraeum	98	28	192	60.4	8	6.0	1	0.8
Silchester, defences	164	73	13	5.2	5	2.1	1	0.4
Silchester, forum-basilica	906	1479	578	19.5	131	5.2	2	0.1
Silchester, insula IX	1510	414	66	3.3	19	1.0	37	1.9
Southwark, Winchester Palace	77	11		0.0		0.0		0.0
Wroxeter, baths and macellum	3428	798	60	1.4	16	0.4	13	0.3
York, General Accident site	170	52	47	17.5	10	4.3	1	0.4
MEAN PERCENTAGE				10.0		2.5		0.3
Late Roman: Military (n=9)								
Birdoswald	632	211	2	0.2		0.0	5	0.6
Brancaster	53	66	3	2.5	1	0.8	1	0.8
Burgh Castle	312	54		0.0		0.0		0.0
Caerleon, baths	3742	568	153	3.4	2	0.0		0.0

Site	Cattle	Sheep/ Goat	domestic fowl	%DF	wetland bird	%WTL bird	other wildfowl	%other WF
Late Roman: Military (n=9) continued								
Caernarfon	**8388**	**643**	**240**	**2.6**	**50**	**0.6**	**21**	**0.2**
Caistor-on-sea	**2456**	**395**	**483**	**14.5**	**191**	**6.3**	**23**	**0.8**
Carr Naze	**175**	**437**	**87**	**12.4**	**41**	**6.3**	**36**	**5.6**
Piercebridge, inner ditch	**7767**	**2034**	**147**	**1.5**	**23**	**0.2**	**12**	**0.1**
Portchester	**10774**	**3212**	**230**	**1.6**	**69**	**0.5**	**39**	**0.3**
MEAN PERCENTAGE				**4.3**		**1.6**		**0.9**
Late Roman: Religious (n=9)								
Brigstock	**46**	**79**	**14**	**10.1**		**0.0**		**0.0**
Chelmsford, temple site	**214**	**110**	**1**	**0.3**	**1**	**0.3**		**0.0**
Henley Wood	**30**	**138**	**3**	**1.8**		**0.0**		**0.0**
Lowbury Hill	**124**	**338**	**6**	**1.3**		**0.0**		**0.0**
St Albans, Folly Lane	**346**	**298**	**4**	**0.6**	**1**	**0.2**	**1**	**0.2**
Uley Shrines	**1773**	**37238**	**1354**	**3.4**	**45**	**0.1**	**8**	**0.0**
Witham	**12047**	**2087**	**60**	**0.4**		**0.0**		**0.0**
MEAN PERCENTAGE				**2.5**		**0.1**		**0.0**

Appendix A.V; Cattle ageing data from dental wear analyses by phase and by site.

Quantities given under headings A to J equal the number of specimens which were recoded under that age stage from each site. For sites with sample sizes above 100 the specimen quantities have been calculated as an average count of specimens to mitigate against oversized samples. Values given under headings %A to %J equal the mean quantities of specimens from each site. The total mean value does not include sites which produced a sample size below 10.

MIDDLE IRON AGE SITES																						
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
North Shoebury	Essex	Rural - minor	0	0	0	1	0	0	1	0	0	2	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	0.0
Kingsmead South	Buckinghamshire	Rural - minor	0	0	0	0	3	1	0	0	0	4	0.0	0.0	0.0	0.0	75.0	25.0	0.0	0.0	0.0
Aston Mill Farm	Worcestershire	Rural - minor	0	0	0	2	2	0	1	0	0	5	0.0	0.0	0.0	40.0	40.0	0.0	20.0	0.0	0.0
Brighton Hill	Hampshire	Rural - minor	0	0	0	1	1	0	3	0	0	5	0.0	0.0	0.0	20.0	20.0	0.0	60.0	0.0	0.0
Weekley	Northamptonshire	Rural - minor	0	1	0	0	10	0	0	0	0	11	0.0	9.1	0.0	0.0	90.9	0.0	0.0	0.0	0.0
Market Deeping	Lincolnshire	Rural - minor	1	3	1	1	2	2	0	2	0	12	8.3	25.0	8.3	8.3	16.7	16.7	0.0	16.7	0.0
Biddenham Loop	Bedfordshire	Rural - minor	0	0	5	0	0	0	7	0	4	16	0.0	0.0	31.3	0.0	0.0	0.0	43.8	0.0	25.0
Claydon Pike, Warrens Field	Gloucestershire	Rural - minor	0	0	1	2	1	8	2	3	0	17	0.0	0.0	5.9	11.8	5.9	47.1	11.8	17.6	0.0
Spratsgate Lane	Gloucestershire	Rural - minor	0	0	5	1	2	1	5	1	2	17	0.0	0.0	29.4	5.9	11.8	5.9	29.4	5.9	11.8
Rooksdown	Hampshire	Rural - minor	2	3	0	1	2	1	5	2	2	18	11.1	16.7	0.0	5.6	11.1	5.6	27.8	11.1	11.1
Suddern Farm	Hampshire	Rural - minor	0	0	1	5	0	8	4	1	0	19	0.0	0.0	5.3	26.3	0.0	42.1	21.1	5.3	0.0
Gravelly Guy	Oxfordshire	Rural - minor	3	3	7	5	1	0	8	0	0	27	11.1	11.1	25.9	18.5	3.7	0.0	29.6	0.0	0.0
Winnall Down	Hampshire	Rural - minor	5	0	5	3	3	8	7	3	2	36	13.9	0.0	13.9	8.3	8.3	22.2	19.4	8.3	5.6
Conderton Camp	Worcestershire	Rural - nucleated	1	8	1	7	5	4	2	10	0	38	2.6	21.1	2.6	18.4	13.2	10.5	5.3	26.3	0.0
Blackhorse Road	Hertfordshire	Rural - minor	0	0	7	6	9	5	7	9	10	53	0.0	0.0	13.2	11.3	17.0	9.4	13.2	17.0	18.9
Danebury	Hampshire	Rural - nucleated	17	12	18	42	7	1	2	0	1	100	17.0	12.0	18.0	42.0	7.0	1.0	2.0	0.0	1.0
Dragonby	Lincolnshire	Rural - nucleated	7	4	8	5	3	19	7	15	32	100	7.0	4.0	8.0	5.0	3.0	19.0	7.0	15.0	32.0
		TOTAL/MEAN	**8**	**7**	**12**	**17**	**11**	**12**	**13**	**10**	**11**	**480**	**5**	**8**	**12**	**12**	**15**	**14**	**16**	**9**	**8**

LATE IRON AGE SITES																						
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Haddenham VI	Cambridgeshire	Rural - minor	0	1	1	0	0	0	0	1	0	3	0.0	33.3	33.3	0.0	0.0	0.0	0.0	33.3	0.0
North Shoebury	Essex	Rural - minor	0	0	2	1	0	1	0	0	0	4	0.0	0.0	50.0	25.0	0.0	25.0	0.0	0.0	0.0
Brighton Hill	Hampshire	Rural - minor	0	0	1	3	2	0	0	0	0	6	0.0	0.0	16.7	50.0	33.3	0.0	0.0	0.0	0.0
Thorpe Lea	Surrey	Rural - minor	0	0	0	2	1	1	1	1	3	9	0.0	0.0	0.0	22.2	11.1	11.1	11.1	11.1	33.3
Suddern Farm	Hampshire	Rural - minor	1	2	1	2	1	1	4	0	0	12	8.3	16.7	8.3	16.7	8.3	8.3	33.3	0.0	0.0
Travelegue	Cornwall	Rural - minor	0	0	0	6	1	4	2	0	0	13	0.0	0.0	0.0	46.2	7.7	30.8	15.4	0.0	0.0
Baldock	Hertfordshire	Rural - nucleated	0	0	5	8	0	0	0	0	0	13	0.0	0.0	38.5	61.5	0.0	0.0	0.0	0.0	0.0
Bicester Fields Farm	Oxfordshire	Rural - minor	0	0	1	4	5	2	1	1	0	14	0.0	0.0	7.1	28.6	35.7	14.3	7.1	7.1	0.0
Watkins Farm	Oxfordshire	Rural - minor	0	2	2	0	4	3	0	3	1	15	0.0	13.3	13.3	0.0	26.7	20.0	0.0	20.0	6.7
Bancroft, temple-mausoleum	Buckinghamshire	Religious	0	6	3	1	1	2	4	0	0	17	0.0	35.3	17.6	5.9	5.9	11.8	23.5	0.0	0.0

LATE IRON AGE SITES continued																					
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Runfold	Surrey	Rural - minor	0	0	0	2	5	3	5	2	1	**18**	0.0	0.0	0.0	11.1	27.8	16.7	27.8	11.1	5.6
Braughing	Hertfordshire	Rural - nucleated	0	1	0	5	2	0	11	0	0	**19**	0.0	5.3	0.0	26.3	10.5	0.0	57.9	0.0	0.0
Mingies Ditch	Oxfordshire	Rural - minor	0	2	8	3	2	3	5	0	0	**23**	0.0	8.7	34.8	13.0	8.7	13.0	21.7	0.0	0.0
West Stow	Suffolk	Rural - minor	0	1	7	4	4	9	0	0	0	**25**	0.0	4.0	28.0	16.0	16.0	36.0	0.0	0.0	0.0
Haddenham V	Cambridgeshire	Rural - minor	5	3	5	6	4	1	5	5	1	**35**	14.3	8.6	14.3	17.1	11.4	2.9	14.3	14.3	2.9
Silchester	Hampshire	Rural - nucleated	0	0	0	3	12	4	10	4	3	**36**	0.0	0.0	0.0	8.3	33.3	11.1	27.8	11.1	8.3
Owslebury	Hampshire	Rural - minor	6	1	1	5	8	1	3	6	28	**59**	10.2	1.7	1.7	8.5	13.6	1.7	5.1	10.2	47.5
Balksbury Camp	Hampshire	Rural - minor	2	1	4	7	1	8	18	9	10	**60**	3.3	1.7	6.7	11.7	1.7	13.3	30.0	15.0	16.7
Dragonby	Lincolnshire	Rural - nucleated	5	3	2	2	8	5	11	9	55	**100**	5.0	3.0	2.0	2.0	8.0	5.0	11.0	9.0	55.0
		TOTAL/MEAN	**4**	**5**	**9**	**13**	**13**	**10**	**17**	**9**	**21**	**481**	**3**	**7**	**11**	**18**	**14**	**12**	**18**	**7**	**10**

IA/RB TRANSITION SITES																					
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Yarford	Somerset	Rural - minor	0	0	0	0	0	1	2	1	0	**4**	0.0	0.0	0.0	0.0	0.0	25.0	50.0	25.0	0.0
Burgh	Suffolk	Rural - minor	1	1	1	3	2	1	1	0	2	**12**	8.3	8.3	8.3	25.0	16.7	8.3	8.3	0.0	16.7
Brighton Hill	Hampshire	Rural - minor	0	0	2	4	1	20	0	0	0	**27**	0.0	0.0	7.4	14.8	3.7	74.1	0.0	0.0	0.0
Claydon Pike, Longdole's Field	Gloucestershire	Rural - minor	0	4	1	3	10	5	5	7	0	**35**	0.0	11.4	2.9	8.6	28.6	14.3	14.3	20.0	0.0
Elms Farm	Essex	Rural - minor	0	0	8	58	0	27	0	7	0	**100**	0.0	0.0	8.0	58.0	0.0	27.0	0.0	7.0	0.0
Owslebury	Hampshire	Rural - minor	0	9	1	4	10	3	5	10	58	**100**	0.0	9.0	1.0	4.0	10.0	3.0	5.0	10.0	58.0
		TOTAL/MEAN	**0**	**5**	**5**	**25**	**8**	**19**	**10**	**8**	**20**	**305**	**1**	**5**	**6**	**21**	**10**	**22**	**16**	**6**	**12**

EARLY ROMAN SITES																					
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Chichester, Rowes Garage	West Sussex	Urban	0	0	0	0	0	0	0	0	1	**1**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
North Shoebury	Essex	Rural - minor	0	0	0	0	2	0	0	1	0	**3**	0.0	0.0	0.0	0.0	66.7	0.0	0.0	33.3	0.0
Parnwell	Cambridgeshire	Rural - minor	0	1	0	1	0	0	2	0	0	**4**	0.0	25.0	0.0	25.0	0.0	0.0	50.0	0.0	0.0
Braughing	Hertfordshire	Rural - nucleated	0	1	0	0	0	0	3	0	0	**4**	0.0	25.0	0.0	0.0	0.0	0.0	75.0	0.0	0.0
Caistor-on-sea	Norfolk	Military	0	0	0	0	0	0	2	1	1	**4**	0.0	0.0	0.0	0.0	0.0	0.0	50.0	25.0	25.0
Kilverstone	Norfolk	Rural - minor	0	0	0	0	2	3	0	0	0	**5**	0.0	0.0	0.0	0.0	40.0	60.0	0.0	0.0	0.0
Hacheston	Suffolk	Rural - nucleated	0	0	0	3	2	0	0	0	0	**5**	0.0	0.0	0.0	60.0	40.0	0.0	0.0	0.0	0.0
Dorchester, County Hospital	Dorset	Urban	0	0	0	0	0	0	6	0	0	**6**	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0
Alchester	Oxfordshire	Military	0	0	0	1	1	0	1	1	2	**6**	0.0	0.0	0.0	16.7	16.7	0.0	16.7	16.7	33.3
Newquay, Atlantic Road	Cornwall	Rural - minor	0	1	3	1	2	0	0	0	0	**7**	0.0	14.3	42.9	14.3	28.6	0.0	0.0	0.0	0.0
Droitwich, Hanbury Street	Worcestershire	Rural - nucleated	0	0	0	0	0	2	1	1	3	**7**	0.0	0.0	0.0	0.0	0.0	28.6	14.3	14.3	42.9
Runfold	Surrey	Rural - minor	0	0	0	1	1	0	3	1	1	**7**	0.0	0.0	0.0	14.3	14.3	0.0	42.9	14.3	14.3
Blackhorse Road	Hertfordshire	Rural - minor	0	0	0	1	0	1	0	2	4	**8**	0.0	0.0	0.0	12.5	0.0	12.5	0.0	25.0	50.0

EARLY ROMAN SITES continued																						
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Grandford	Cambridgeshire	Rural - nucleated	0	0	0	4	1	0	0	4	0	**9**	0.0	0.0	0.0	44.4	11.1	0.0	0.0	44.4	0.0
Thorpe Lea	Surrey	Rural - minor	0	2	0	1	5	0	0	2	0	**10**	0.0	20.0	0.0	10.0	50.0	0.0	0.0	20.0	0.0
Caerleon, baths	Newport	Military	0	0	0	0	3	7	0	0	0	**10**	0.0	0.0	0.0	0.0	30.0	70.0	0.0	0.0	0.0
Alcester	Warwickshire	Rural - nucleated	0	1	0	0	2	2	3	3	0	**11**	0.0	9.1	0.0	0.0	18.2	18.2	27.3	27.3	0.0
Conderton Camp	Worcestershire	Rural - nucleated	0	3	0	3	0	0	1	4	0	**11**	0.0	27.3	0.0	27.3	0.0	0.0	9.1	36.4	0.0
Biddenham Loop	Bedfordshire	Rural - minor	0	3	0	2	1	1	6	0	0	**13**	0.0	23.1	0.0	15.4	7.7	7.7	46.2	0.0	0.0
Fishbourne, all sites	West Sussex	Rural - minor	0	2	6	3	1	0	2	0	1	**15**	0.0	13.3	40.0	20.0	6.7	0.0	13.3	0.0	6.7
Stonea	Cambridgeshire	Rural - minor	1	1	1	3	1	3	3	2	1	**16**	6.3	6.3	6.3	18.8	6.3	18.8	18.8	12.5	6.3
Asthall	Oxfordshire	Rural - nucleated	4	2	0	0	2	5	1	5	0	**19**	21.1	10.5	0.0	0.0	10.5	26.3	5.3	26.3	0.0
Droitwich, Dodderhill	Worcestershire	Military	0	0	3	3	0	1	4	4	4	**19**	0.0	0.0	15.8	15.8	0.0	5.3	21.1	21.1	21.1
Haddon	Cambridgeshire	Rural - minor	0	4	5	2	6	0	3	0	0	**20**	0.0	20.0	25.0	10.0	30.0	0.0	15.0	0.0	0.0
Silchester, forum-basilica	Hampshire	Urban	2	0	1	4	1	4	4	2	4	**22**	9.1	0.0	4.5	18.2	4.5	18.2	18.2	9.1	18.2
Castleford	West Yorkshire	Rural - nucleated	0	0	0	2	1	1	13	0	6	**23**	0.0	0.0	0.0	8.7	4.3	4.3	56.5	0.0	26.1
Dragonby	Lincolnshire	Rural - nucleated	3	0	1	0	1	2	2	4	16	**29**	10.3	0.0	3.4	0.0	3.4	6.9	6.9	13.8	55.2
Shepton Mallet	Somerset	Rural - nucleated	2	0	0	1	7	5	14	2	0	**31**	6.5	0.0	0.0	3.2	22.6	16.1	45.2	6.5	0.0
Gussage All Saints	Dorset	Rural - minor	0	0	7	1	5	18	0	2	0	**33**	0.0	0.0	21.2	3.0	15.2	54.5	0.0	6.1	0.0
Birdoswald	Cumbria	Military	0	0	0	1	13	0	20	0	0	**34**	0.0	0.0	0.0	2.9	38.2	0.0	58.8	0.0	0.0
Owslebury	Hampshire	Rural - minor	0	1	1	5	5	0	2	3	19	**36**	0.0	2.8	2.8	13.9	13.9	0.0	5.6	8.3	52.8
Exeter	Devon	Urban	0	0	0	1	0	8	1	20	8	**38**	0.0	0.0	0.0	2.6	0.0	21.1	2.6	52.6	21.1
Chichester, Cattlemarket	West Sussex	Urban	0	0	6	6	0	3	14	9	11	**49**	0.0	0.0	12.2	12.2	0.0	6.1	28.6	18.4	22.4
Gorhambury	Hertfordshire	Rural - minor	0	0	9	0	4	17	14	10	0	**54**	0.0	0.0	16.7	0.0	7.4	31.5	25.9	18.5	0.0
Claydon Pike, Longdole's Field	Gloucestershire	Rural - minor	0	3	2	6	11	11	9	14	1	**57**	0.0	5.3	3.5	10.5	19.3	19.3	15.8	24.6	1.8
Dorchester, Greyhound Yard	Dorset	Urban	4	4	1	3	8	47	0	0	0	**67**	6.0	6.0	1.5	4.5	11.9	70.1	0.0	0.0	0.0
Loughor	West Glamorgan	Military	0	0	1	2	15	10	21	7	11	**67**	0.0	0.0	1.5	3.0	22.4	14.9	31.3	10.4	16.4
Catterick, all sites	North Yorkshire	Rural - nucleated	0	1	2	5	15	4	15	12	24	**78**	0.0	1.3	2.6	6.4	19.2	5.1	19.2	15.4	30.8
York, General Accident site	North Yorkshire	Urban	0	0	0	2	37	0	41	0	0	**80**	0.0	0.0	0.0	2.5	46.3	0.0	51.3	0.0	0.0
Elms Farm	Essex	Rural - minor	0	0	2	37	0	44	0	17	0	**100**	0.0	0.0	2.0	37.0	0.0	44.0	0.0	17.0	0.0
Baldock	Hertfordshire	Rural - nucleated	2	0	13	46	6	25	8	0	0	**100**	2.0	0.0	13.0	46.0	6.0	25.0	8.0	0.0	0.0
Colchester	Essex	Urban	0	1	2	13	7	77	0	0	0	**100**	0.0	1.0	2.0	13.0	7.0	77.0	0.0	0.0	0.0
Castleford	West Yorkshire	Military	0	0	1	5	11	13	31	15	24	**100**	0.0	0.0	1.0	5.0	11.0	13.0	31.0	15.0	24.0
		TOTAL/MEAN	**1**	**2**	**5**	**13**	**14**	**24**	**19**	**11**	**11**	**1318**	**2**	**5**	**6**	**11**	**14**	**20**	**19**	**12**	**10**

LATE ROMAN SITES																					
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Newquay, Atlantic Road	Cornwall	Rural - minor	0	1	0	0	1	0	0	0	0	**2**	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0
Yarford	Somerset	Rural - minor	0	0	0	0	0	0	1	0	1	**2**	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0

LATE ROMAN SITES continued																					
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Fishbourne, Harbour	West Sussex	Rural - minor	0	0	0	0	0	2	1	0	0	**3**	0.0	0.0	0.0	0.0	0.0	66.7	33.3	0.0	0.0
North Shoebury	Essex	Rural - minor	0	0	0	0	3	0	0	0	0	**3**	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0
Droitwich, Hanbury Street	Worcestershire	Rural - nucleated	0	0	0	0	0	0	0	2	1	**3**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	33.3
York, General Accident site	North Yorkshire	Urban	0	0	0	1	5	0	0	0	0	**6**	0.0	0.0	0.0	16.7	83.3	0.0	0.0	0.0	0.0
Westhampnett	West Sussex	Rural - minor	0	0	0	0	3	1	3	0	0	**7**	0.0	0.0	0.0	0.0	42.9	14.3	42.9	0.0	0.0
Chapperton Down	Wiltshire	Rural - minor	1	0	0	1	1	3	0	2	0	**8**	12.5	0.0	0.0	12.5	12.5	37.5	0.0	25.0	0.0
Dalton Parlours	West Yorkshire	Rural - minor	1	0	0	0	0	1	1	2	4	**9**	11.1	0.0	0.0	0.0	0.0	11.1	11.1	22.2	44.4
Kilverstone	Norfolk	Rural - minor	0	1	3	0	0	4	1	0	0	**9**	0.0	11.1	33.3	0.0	0.0	44.4	11.1	0.0	0.0
Monk Sherborne	Hampshire	Rural - minor	2	1	1	0	1	3	7	1	0	**16**	12.5	6.3	6.3	0.0	6.3	18.8	43.8	6.3	0.0
Thorpe Lea	Surrey	Rural - minor	0	2	1	3	5	3	1	2	0	**17**	0.0	11.8	5.9	17.6	29.4	17.6	5.9	11.8	0.0
Dorchester, County Hospital	Dorset	Urban	0	0	0	0	2	16	0	0	0	**18**	0.0	0.0	0.0	0.0	11.1	88.9	0.0	0.0	0.0
Braughing	Hertfordshire	Rural - nucleated	0	1	2	1	1	0	17	0	0	**22**	0.0	4.5	9.1	4.5	4.5	0.0	77.3	0.0	0.0
Stonea	Cambridgeshire	Rural - minor	1	1	3	7	2	1	0	2	7	**24**	4.2	4.2	12.5	29.2	8.3	4.2	0.0	8.3	29.2
Watergate	West Sussex	Rural - minor	0	2	2	4	6	1	3	5	5	**28**	0.0	7.1	7.1	14.3	21.4	3.6	10.7	17.9	17.9
Catterick, all sites	North Yorkshire	Rural - nucleated	1	0	0	2	6	5	5	6	8	**33**	3.0	0.0	0.0	6.1	18.2	15.2	15.2	18.2	24.2
Castleford	West Yorkshire	Rural - nucleated	0	0	1	0	2	3	16	6	14	**42**	0.0	0.0	2.4	0.0	4.8	7.1	38.1	14.3	33.3
Bancroft	Buckinghamshire	Rural - minor	2	2	8	5	6	2	1	3	15	**44**	4.5	4.5	18.2	11.4	13.6	4.5	2.3	6.8	34.1
Silchester, insula IX	Hampshire	Urban	1	1	0	3	16	14	11	0	0	**46**	2.2	2.2	0.0	6.5	34.8	30.4	23.9	0.0	0.0
Batten Hanger	West Sussex	Rural - minor	0	0	2	7	4	5	14	4	12	**48**	0.0	0.0	4.2	14.6	8.3	10.4	29.2	8.3	25.0
Hacheston	Suffolk	Rural - nucleated	0	0	3	15	22	9	0	0	0	**49**	0.0	0.0	6.1	30.6	44.9	18.4	0.0	0.0	0.0
Chichester, Cattlemarket	West Sussex	Urban	0	1	0	5	6	10	10	12	6	**50**	0.0	2.0	0.0	10.0	12.0	20.0	20.0	24.0	12.0
Claydon Pike, Longdole's Field	Gloucestershire	Rural - minor	0	6	0	4	5	8	15	12	1	**51**	0.0	11.8	0.0	7.8	9.8	15.7	29.4	23.5	2.0
Gussage All Saints	Dorset	Rural - minor	0	0	6	9	1	32	0	5	0	**53**	0.0	0.0	11.3	17.0	1.9	60.4	0.0	9.4	0.0
Wayside Farm	Wiltshire	Rural - minor	0	0	0	4	25	19	7	3	0	**58**	0.0	0.0	0.0	6.9	43.1	32.8	12.1	5.2	0.0
Cirencester (Maltby)	Gloucestershire	Urban	0	0	0	6	0	12	16	16	16	**66**	0.0	0.0	0.0	9.1	0.0	18.2	24.2	24.2	24.2
Owslebury	Hampshire	Rural - minor	0	6	1	1	6	2	5	9	51	**81**	0.0	7.4	1.2	1.2	7.4	2.5	6.2	11.1	63.0
Dragonby	Lincolnshire	Rural - nucleated	4	2	6	4	2	3	7	10	57	**95**	4.2	2.1	6.3	4.2	2.1	3.2	7.4	10.5	60.0
Elms Farm	Essex	Rural - minor	0	0	5	13	0	60	0	22	0	**100**	0.0	0.0	5.0	13.0	0.0	60.0	0.0	22.0	0.0
Piercebridge, large vicus building	Durham	Rural - nucleated	0	2	12	4	5	42	35	0	0	**100**	0.0	2.0	12.0	4.0	5.0	42.0	35.0	0.0	0.0
Piercebridge, outer ditch	Durham	Rural - nucleated	0	1	13	3	8	36	39	0	0	**100**	0.0	1.0	13.0	3.0	8.0	36.0	39.0	0.0	0.0
Dorchester, Greyhound Yard	Dorset	Urban	8	3	1	4	16	23	45	0	0	**100**	8.0	3.0	1.0	4.0	16.0	23.0	45.0	0.0	0.0
Caistor-on-sea	Norfolk	Military	0	1	1	1	4	9	14	12	58	**100**	0.0	1.0	1.0	1.0	4.0	9.0	14.0	12.0	58.0
Piercebridge, inner ditch	Durham	Military	0	1	11	0	16	33	39	0	0	**100**	0.0	1.0	11.0	0.0	16.0	33.0	39.0	0.0	0.0
		TOTAL/MEAN	**1**	**2**	**5**	**7**	**12**	**24**	**21**	**9**	**17**	**1493**	**2**	**3**	**5**	**9**	**13**	**23**	**21**	**9**	**15**

Appendix A.VI; Sheep/Goat ageing data from dental wear analyses by phase and by site.

Quantities given under headings A to J equal the number of specimens which were recoded under that age stage from each site. For sites with sample sizes above 100 the specimen quantities have been calculated as an average count of specimens to mitigate against oversized samples. Values given under headings %A to %J equal the mean quantities of specimens from each site. The total mean value does not include sites which produced a sample size below 10.

MIDDLE IRON AGE SITES																						
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
North Shoebury	Essex	Rural - minor	0	0	0	0	0	2	1	0	0	**3**	0.0	0.0	0.0	0.0	0.0	66.7	33.3	0.0	0.0
Biddenham Loop	Bedfordshire	Rural - minor	0	0	6	0	2	3	1	0	0	**12**	0.0	0.0	50.0	0.0	16.7	25.0	8.3	0.0	0.0
Dolland's Moor	Kent	Rural - minor	0	0	1	1	3	0	1	5	2	**13**	0.0	0.0	7.7	7.7	23.1	0.0	7.7	38.5	15.4
Brighton Hill	Hampshire	Rural - minor	0	0	4	2	8	3	0	0	0	**17**	0.0	0.0	23.5	11.8	47.1	17.6	0.0	0.0	0.0
Spratsgate Lane	Gloucestershire	Rural - minor	0	0	1	0	8	3	2	7	0	**21**	0.0	0.0	4.8	0.0	38.1	14.3	9.5	33.3	0.0
Aston Mill Farm	Worcestershire	Rural - minor	0	3	7	4	0	3	4	0	1	**22**	0.0	13.6	31.8	18.2	0.0	13.6	18.2	0.0	4.5
Blackhorse Road	Hertfordshire	Rural - minor	0	0	8	4	4	3	5	3	0	**27**	0.0	0.0	29.6	14.8	14.8	11.1	18.5	11.1	0.0
Claydon Pike, Warrens Field	Gloucestershire	Rural - minor	0	1	8	0	9	10	3	0	0	**31**	0.0	3.2	25.8	0.0	29.0	32.3	9.7	0.0	0.0
Market Deeping	Lincolnshire	Rural - minor	1	0	14	6	7	9	1	0	0	**38**	2.6	0.0	36.8	15.8	18.4	23.7	2.6	0.0	0.0
Suddern Farm	Hampshire	Rural - minor	3	4	9	7	1	11	7	4	0	**46**	6.5	8.7	19.6	15.2	2.2	23.9	15.2	8.7	0.0
Ashville Trading Estate	Oxfordshire	Rural - minor	0	3	9	10	7	3	16	3	0	**51**	0.0	5.9	17.6	19.6	13.7	5.9	31.4	5.9	0.0
Rooksdown	Hampshire	Rural - minor	0	0	15	13	6	8	9	0	0	**51**	0.0	0.0	29.4	25.5	11.8	15.7	17.6	0.0	0.0
Conderton Camp	Worcestershire	Rural - nucleated	0	17	0	15	9	0	11	0	0	**52**	0.0	32.7	0.0	28.8	17.3	0.0	21.2	0.0	0.0
Old Down Farm	Hampshire	Rural - minor	2	11	19	2	1	10	7	2	1	**55**	3.6	20.0	34.5	3.6	1.8	18.2	12.7	3.6	1.8
Weekley	Northamptonshire	Rural - minor	0	6	7	42	0	0	0	0	0	**55**	0.0	10.9	12.7	76.4	0.0	0.0	0.0	0.0	0.0
Houghton Down (Hamilton)	Hampshire	Rural - minor	5	9	11	3	19	8	1	1	0	**57**	8.8	15.8	19.3	5.3	33.3	14.0	1.8	1.8	0.0
Owslebury	Hampshire	Rural - minor	0	22	18	9	6	14	6	9	0	**84**	0.0	26.2	21.4	10.7	7.1	16.7	7.1	10.7	0.0
Dragonby	Lincolnshire	Rural - nucleated	3	4	9	3	3	19	4	18	32	**95**	3.2	4.2	9.5	3.2	3.2	20.0	4.2	18.9	33.7
Winnall Down	Hampshire	Rural - minor	3	14	39	6	7	7	15	6	0	**97**	3.1	14.4	40.2	6.2	7.2	7.2	15.5	6.2	0.0
Gravelly Guy	Oxfordshire	Rural - minor	5	9	25	17	10	8	22	3	1	**100**	5.0	9.0	25.0	17.0	10.0	8.0	22.0	3.0	1.0
Danebury	Hampshire	Rural - nucleated	6	12	27	12	12	14	15	2	0	**100**	6.0	12.0	27.0	12.0	12.0	14.0	15.0	2.0	0.0
Maiden Castle	Dorset	Rural - nucleated	2	6	21	10	4	20	29	6	2	**100**	2.0	6.0	21.0	10.0	4.0	20.0	29.0	6.0	2.0
		TOTAL	**3**	**11**	**23**	**15**	**12**	**14**	**14**	**6**	**3**	**1144**	**2**	**8**	**23**	**15**	**16**	**14**	**12**	**7**	**3**

LATE IRON AGE SITES																					
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Biddenham Loop	Bedfordshire	Rural - minor	0	0	1	1	0	0	0	0	0	**2**	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0
North Shoebury	Essex	Rural - minor	0	0	1	1	1	1	0	0	0	**4**	0.0	0.0	25.0	25.0	25.0	25.0	0.0	0.0	0.0
Dolland's Moor	Kent	Rural - minor	0	0	0	1	2	1	0	2	0	**6**	0.0	0.0	0.0	16.7	33.3	16.7	0.0	33.3	0.0
Thorpe Lea	Surrey	Rural - minor	0	0	1	2	1	4	0	0	0	**8**	0.0	0.0	12.5	25.0	12.5	50.0	0.0	0.0	0.0

LATE IRON AGE SITES continued																						
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Dalton Parlours	West Yorkshire	Rural - minor	0	1	1	2	0	1	3	1	0	**9**	0.0	11.1	11.1	22.2	0.0	11.1	33.3	11.1	0.0
Baldock	Hertfordshire	Rural - nucleated	0	9	0	0	0	0	0	0	0	**9**	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grimthorpe	South Yorkshire	Rural - nucleated	0	0	0	8	3	0	0	0	0	**11**	0.0	0.0	0.0	72.7	27.3	0.0	0.0	0.0	0.0
Bicester Fields Farm	Oxfordshire	Rural - minor	1	1	1	1	4	3	5	0	0	**16**	6.3	6.3	6.3	6.3	25.0	18.8	31.3	0.0	0.0
Haddenham VI	Cambridgeshire	Rural - minor	0	1	6	0	4	0	3	2	0	**16**	0.0	6.3	37.5	0.0	25.0	0.0	18.8	12.5	0.0
Ashville Trading Estate	Oxfordshire	Rural - minor	0	0	6	6	2	0	4	1	0	**19**	0.0	0.0	31.6	31.6	10.5	0.0	21.1	5.3	0.0
Brighton Hill	Hampshire	Rural - minor	1	1	8	7	2	3	1	0	0	**23**	4.3	4.3	34.8	30.4	8.7	13.0	4.3	0.0	0.0
Runfold	Surrey	Rural - minor	0	0	2	3	4	5	8	2	0	**24**	0.0	0.0	8.3	12.5	16.7	20.8	33.3	8.3	0.0
Travelegue	Cornwall	Rural - minor	0	7	11	3	2	1	2	0	0	**26**	0.0	26.9	42.3	11.5	7.7	3.8	7.7	0.0	0.0
Bancroft, temple-mausoleum	Buckinghamshire	Religious	0	1	4	4	5	8	3	1	1	**27**	0.0	3.7	14.8	14.8	18.5	29.6	11.1	3.7	3.7
Danebury	Hampshire	Rural - nucleated	0	4	5	7	5	8	4	0	0	**33**	0.0	12.1	15.2	21.2	15.2	24.2	12.1	0.0	0.0
Barton Court Farm	Oxfordshire	Rural - minor	1	2	11	6	6	4	8	0	0	**38**	2.6	5.3	28.9	15.8	15.8	10.5	21.1	0.0	0.0
Mingies Ditch	Oxfordshire	Rural - minor	0	6	15	3	7	4	3	0	0	**38**	0.0	15.8	39.5	7.9	18.4	10.5	7.9	0.0	0.0
West Stow	Suffolk	Rural - minor	0	2	10	9	8	11	1	0	0	**41**	0.0	4.9	24.4	22.0	19.5	26.8	2.4	0.0	0.0
Watkins Farm	Oxfordshire	Rural - minor	0	2	13	1	5	8	13	1	0	**43**	0.0	4.7	30.2	2.3	11.6	18.6	30.2	2.3	0.0
Suddern Farm	Hampshire	Rural - minor	7	3	10	8	3	9	5	0	0	**45**	15.6	6.7	22.2	17.8	6.7	20.0	11.1	0.0	0.0
Edix Hill	Cambridgeshire	Rural - minor	1	5	16	8	8	5	3	2	0	**48**	2.1	10.4	33.3	16.7	16.7	10.4	6.3	4.2	0.0
Nettlebank Copse	Hampshire	Rural - minor	1	3	9	13	13	9	9	0	1	**58**	1.7	5.2	15.5	22.4	22.4	15.5	15.5	0.0	1.7
Owslebury	Hampshire	Rural - minor	0	5	7	13	12	9	8	6	0	**60**	0.0	8.3	11.7	21.7	20.0	15.0	13.3	10.0	0.0
Silchester, oppidum	Hampshire	Rural - nucleated	3	10	7	17	8	15	8	0	0	**68**	4.4	14.7	10.3	25.0	11.8	22.1	11.8	0.0	0.0
Balksbury Camp	Hampshire	Rural - minor	6	15	34	9	7	16	7	4	2	**100**	6.0	15.0	34.0	9.0	7.0	16.0	7.0	4.0	2.0
Haddenham V	Cambridgeshire	Rural - minor	1	18	38	11	7	3	20	1	1	**100**	1.0	18.0	38.0	11.0	7.0	3.0	20.0	1.0	1.0
Dragonby	Lincolnshire	Rural - nucleated	1	5	12	3	4	23	3	18	31	**100**	1.0	5.0	12.0	3.0	4.0	23.0	3.0	18.0	31.0
		TOTAL	**2**	**10**	**24**	**15**	**13**	**15**	**12**	**4**	**4**	995	**2**	**8**	**24**	**18**	**15**	**14**	**13**	**3**	**2**

IA/RB TRANSITION SITES																						
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Lavant	West Sussex	Rural - minor	0	1	1	1	0	2	0	2	0	**7**	0.0	14.3	14.3	14.3	0.0	28.6	0.0	28.6	0.0
Yarford	Somerset	Rural - minor	0	1	0	0	3	1	2	0	0	**7**	0.0	14.3	0.0	0.0	42.9	14.3	28.6	0.0	0.0
Houghton Down (Hamilton)	Hampshire	Rural - minor	1	0	1	4	4	1	7	0	0	**18**	5.6	0.0	5.6	22.2	22.2	5.6	38.9	0.0	0.0
Bancroft, temple-mausoleum	Buckinghamshire	Religious	0	2	6	4	2	1	2	3	0	**20**	0.0	10.0	30.0	20.0	10.0	5.0	10.0	15.0	0.0
Brighton Hill	Hampshire	Rural - minor	1	3	6	7	2	3	1	0	0	**23**	4.3	13.0	26.1	30.4	8.7	13.0	4.3	0.0	0.0
Rooksdown	Hampshire	Rural - minor	0	1	6	4	2	5	4	1	3	**26**	0.0	3.8	23.1	15.4	7.7	19.2	15.4	3.8	11.5
Abbotstone Down	Hampshire	Rural - minor	0	0	3	9	9	5	4	0	0	**30**	0.0	0.0	10.0	30.0	30.0	16.7	13.3	0.0	0.0
Burgh	Suffolk	Rural - minor	0	1	24	10	6	3	5	1	1	**51**	0.0	2.0	47.1	19.6	11.8	5.9	9.8	2.0	2.0
Claydon Pike, Longdole's Field	Gloucestershire	Rural - minor	0	2	3	14	15	8	13	0	0	**55**	0.0	3.6	5.5	25.5	27.3	14.5	23.6	0.0	0.0

IA/RB TRANSITION SITES continued

Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Micheldever Wood	Hampshire	Rural - minor	1	3	16	15	8	10	12	2	0	**67**	1.5	4.5	23.9	22.4	11.9	14.9	17.9	3.0	0.0
Elms Farm	Essex	Rural - minor	0	5	17	18	16	6	5	2	0	**69**	0.0	7.2	24.6	26.1	23.2	8.7	7.2	2.9	0.0
Ditches	Gloucestershire	Rural - nucleated	2	1	4	37	18	15	8	0	0	**85**	2.4	1.2	4.7	43.5	21.2	17.6	9.4	0.0	0.0
Owslebury	Hampshire	Rural - minor	0	5	16	27	7	22	16	7	0	**100**	0.0	5.0	16.0	27.0	7.0	22.0	16.0	7.0	0.0
Suddern Farm	Hanpshire	Rural - minor	0	2	12	18	15	18	17	18	0	**100**	0.0	2.0	12.0	18.0	15.0	18.0	17.0	18.0	0.0
Braughing	Hertfordshire	Rural - nucleated	0	14	25	14	7	0	40	0	0	**100**	0.0	14.0	25.0	14.0	7.0	0.0	40.0	0.0	0.0
		TOTAL	**1**	**6**	**18**	**24**	**15**	**13**	**17**	**5**	**1**	**793**	**1**	**6**	**19**	**24**	**16**	**13**	**16**	**4**	**1**

EARLY ROMAN SITES

Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Caerleon, baths	Newport	Military	0	0	0	0	1	1	0	0	0	**2**	0.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0
Blackhorse Road	Hertfordshire	Rural - minor	0	0	0	0	1	1	1	0	0	**3**	0.0	0.0	0.0	0.0	33.3	33.3	33.3	0.0	0.0
Thorpe Lea	Surrey	Rural - minor	0	1	0	1	1	0	0	0	0	**3**	0.0	33.3	0.0	33.3	33.3	0.0	0.0	0.0	0.0
Parnwell	Cambridgeshire	Rural - minor	0	0	2	0	2	0	0	0	0	**4**	0.0	0.0	50.0	0.0	50.0	0.0	0.0	0.0	0.0
Chichester, Rowes Garage	West Sussex	Urban	0	0	0	1	0	2	1	0	0	**4**	0.0	0.0	0.0	25.0	0.0	50.0	25.0	0.0	0.0
Dolland's Moor	Kent	Rural - minor	0	0	0	1	1	1	0	1	1	**5**	0.0	0.0	0.0	20.0	20.0	20.0	0.0	20.0	20.0
Uffington White Horse	Oxfordshire	Rural - minor	0	1	2	2	0	0	0	0	0	**5**	0.0	20.0	40.0	40.0	0.0	0.0	0.0	0.0	0.0
Droitwich, Hanbury Street	Worcestershire	Rural - nucleated	0	0	1	3	1	0	0	0	0	**5**	0.0	0.0	20.0	60.0	20.0	0.0	0.0	0.0	0.0
North Shoebury	Essex	Rural - minor	0	0	1	2	1	1	1	0	0	**6**	0.0	0.0	16.7	33.3	16.7	16.7	16.7	0.0	0.0
Hacheston	Suffolk	Rural - nucleated	0	0	1	3	2	0	0	0	0	**6**	0.0	0.0	16.7	50.0	33.3	0.0	0.0	0.0	0.0
Kilverstone	Norfolk	Rural - minor	0	0	0	0	1	5	2	0	0	**8**	0.0	0.0	0.0	0.0	12.5	62.5	25.0	0.0	0.0
Castle Copse	Wiltshire	Rural - minor	0	5	0	0	1	3	1	0	0	**10**	0.0	50.0	0.0	0.0	10.0	30.0	10.0	0.0	0.0
Alchester	Oxfordshire	Military	0	0	2	4	2	1	0	2	0	**11**	0.0	0.0	18.2	36.4	18.2	9.1	0.0	18.2	0.0
Dorchester, County Hospital	Dorset	Urban	1	0	0	1	10	0	0	0	0	**12**	8.3	0.0	0.0	8.3	83.3	0.0	0.0	0.0	0.0
Runfold	Surrey	Rural - minor	0	0	1	0	6	1	7	0	0	**15**	0.0	0.0	6.7	0.0	40.0	6.7	46.7	0.0	0.0
Birdoswald	Cumbria	Military	0	1	0	0	6	4	5	0	0	**16**	0.0	6.3	0.0	0.0	37.5	25.0	31.3	0.0	0.0
Loughor	West Glamorgan	Military	3	0	2	8	6	3	2	1	0	**25**	12.0	0.0	8.0	32.0	24.0	12.0	8.0	4.0	0.0
Silchester, forum-basilica	Hampshire	Urban	3	5	0	10	7	4	2	1	0	**32**	9.4	15.6	0.0	31.3	21.9	12.5	6.3	3.1	0.0
Alcester	Warwickshire	Rural - nucleated	1	2	7	6	4	5	0	10	0	**35**	2.9	5.7	20.0	17.1	11.4	14.3	0.0	28.6	0.0
Biddenham Loop	Bedfordshire	Rural - minor	0	3	3	13	17	0	0	0	0	**36**	0.0	8.3	8.3	36.1	47.2	0.0	0.0	0.0	0.0
Newquay, Atlantic Road	Cornwall	Rural - minor	0	3	3	11	6	5	4	1	3	**36**	0.0	8.3	8.3	30.6	16.7	13.9	11.1	2.8	8.3
Braughing	Hertfordshire	Rural - nucleated	0	6	12	5	3	0	14	0	0	**40**	0.0	15.0	30.0	12.5	7.5	0.0	35.0	0.0	0.0
Castleford	West Yorkshire	Rural - nucleated	0	2	3	11	10	5	5	3	1	**40**	0.0	5.0	7.5	27.5	25.0	12.5	12.5	7.5	2.5
Stonea	Cambridgeshire	Rural - minor	0	3	9	8	6	12	7	0	0	**45**	0.0	6.7	20.0	17.8	13.3	26.7	15.6	0.0	0.0
Skeleton Green	Hertfordshire	Rural - nucleated	0	9	8	9	10	9	0	0	0	**45**	0.0	20.0	17.8	20.0	22.2	20.0	0.0	0.0	0.0
Haddon	Cambridgeshire	Rural - minor	2	13	5	15	11	0	0	0	0	**46**	4.3	28.3	10.9	32.6	23.9	0.0	0.0	0.0	0.0

EARLY ROMAN SITES continued																					
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Conderton Camp	Worcestershire	Rural - nucleated	0	18	1	14	1	6	12	0	0	**52**	0.0	34.6	1.9	26.9	1.9	11.5	23.1	0.0	0.0
Shepton Mallet	Somerset	Rural - nucleated	0	0	1	3	6	29	8	5	0	**52**	0.0	0.0	1.9	5.8	11.5	55.8	15.4	9.6	0.0
Asthall	Oxfordshire	Rural - nucleated	0	0	11	16	12	10	7	0	0	**56**	0.0	0.0	19.6	28.6	21.4	17.9	12.5	0.0	0.0
Elms Farm	Essex	Rural - minor	0	1	10	14	16	12	7	3	0	**63**	0.0	1.6	15.9	22.2	25.4	19.0	11.1	4.8	0.0
Winnall Down	Hampshire	Rural - minor	1	3	15	6	15	9	13	2	0	**64**	1.6	4.7	23.4	9.4	23.4	14.1	20.3	3.1	0.0
Baldock	Hertfordshire	Rural - nucleated	1	3	17	1	6	44	15	0	0	**87**	1.1	3.4	19.5	1.1	6.9	50.6	17.2	0.0	0.0
Owslebury	Hampshire	Rural - minor	0	5	14	21	9	19	11	10	0	**89**	0.0	5.6	15.7	23.6	10.1	21.3	12.4	11.2	0.0
Barton Court Farm	Oxfordshire	Rural - minor	0	1	6	30	28	12	17	3	2	**99**	0.0	1.0	6.1	30.3	28.3	12.1	17.2	3.0	2.0
Claydon Pike, Longdole's Field	Gloucestershire	Rural - minor	0	4	8	12	16	30	28	1	1	**100**	0.0	4.0	8.0	12.0	16.0	30.0	28.0	1.0	1.0
Elms Farm	Essex	Rural - minor	1	3	38	12	21	9	13	2	1	**100**	1.0	3.0	38.0	12.0	21.0	9.0	13.0	2.0	1.0
Fishbourne, all sites	West Sussex	Rural - minor	2	6	13	15	25	18	12	3	6	**100**	2.0	6.0	13.0	15.0	25.0	18.0	12.0	3.0	6.0
Gussage All Saints	Dorset	Rural - minor	0	0	31	8	5	47	0	9	0	**100**	0.0	0.0	31.0	8.0	5.0	47.0	0.0	9.0	0.0
Grandford	Cambridgeshire	Rural - nucleated	0	0	0	11	18	30	36	5	0	**100**	0.0	0.0	0.0	11.0	18.0	30.0	36.0	5.0	0.0
Catterick, all sites	North Yorkshire	Rural - nucleated	0	7	13	44	15	8	7	5	1	**100**	0.0	7.0	13.0	44.0	15.0	8.0	7.0	5.0	1.0
Dragonby	Lincolnshire	Rural - nucleated	1	3	5	8	6	28	2	16	31	**100**	1.0	3.0	5.0	8.0	6.0	28.0	2.0	16.0	31.0
Chichester, Cattlemarket	West Sussex	Urban	0	4	16	15	21	13	18	7	6	**100**	0.0	4.0	16.0	15.0	21.0	13.0	18.0	7.0	6.0
Colchester	Essex	Urban	1	28	24	14	6	14	8	4	1	**100**	1.0	28.0	24.0	14.0	6.0	14.0	8.0	4.0	1.0
Dorchester, Greyhound Yard	Dorset	Urban	3	6	7	32	25	16	11	0	0	**100**	3.0	6.0	7.0	32.0	25.0	16.0	11.0	0.0	0.0
Exeter	Devon	Urban	6	5	4	47	20	9	2	4	3	**100**	6.0	5.0	4.0	47.0	20.0	9.0	2.0	4.0	3.0
York, General Accident site	North Yorkshire	Urban	0	32	8	18	40	0	2	0	0	**100**	0.0	32.0	8.0	18.0	40.0	0.0	2.0	0.0	0.0
Castleford	West Yorkshire	Military	0	10	13	26	20	9	11	8	3	**100**	0.0	10.0	13.0	26.0	20.0	9.0	11.0	8.0	3.0
		TOTAL	**1**	**8**	**13**	**20**	**19**	**18**	**12**	**4**	**3**	**2357**	**1**	**9**	**12**	**20**	**21**	**17**	**13**	**4**	**2**

LATE ROMAN SITES																					
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
York, General Accident site	North Yorkshire	Urban	0	0	1	0	0	0	0	0	0	**1**	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Droitwich, Hanbury Street	Worcestershire	Rural - nucleated	0	0	0	2	0	1	1	0	0	**4**	0.0	0.0	0.0	50.0	0.0	25.0	25.0	0.0	0.0
Thorpe Lea	Surrey	Rural - minor	0	1	0	0	3	1	0	0	0	**5**	0.0	20.0	0.0	0.0	60.0	20.0	0.0	0.0	0.0
Yarford	Somerset	Rural - minor	0	1	3	1	0	0	0	0	0	**5**	0.0	20.0	60.0	20.0	0.0	0.0	0.0	0.0	0.0
Fishbourne, Harbour	West Sussex	Rural - minor	0	0	0	1	1	2	1	1	0	**6**	0.0	0.0	0.0	16.7	16.7	33.3	16.7	16.7	0.0
North Shoebury	Essex	Rural - minor	0	0	2	2	1	1	1	0	1	**8**	0.0	0.0	25.0	25.0	12.5	12.5	12.5	0.0	12.5
Castle Copse	Wiltshire	Rural - minor	0	1	1	1	0	5	1	0	0	**9**	0.0	11.1	11.1	11.1	0.0	55.6	11.1	0.0	0.0
Westhampnett	West Sussex	Rural - minor	0	0	0	1	3	4	1	0	0	**9**	0.0	0.0	0.0	11.1	33.3	44.4	11.1	0.0	0.0
Wainscott	Kent	Rural - minor	0	1	1	1	0	3	0	2	2	**10**	0.0	10.0	10.0	10.0	0.0	30.0	0.0	20.0	20.0
Watergate	West Sussex	Rural - minor	0	2	3	2	1	2	1	0	0	**11**	0.0	18.2	27.3	18.2	9.1	18.2	9.1	0.0	0.0
Dorchester, County Hospital	Dorset	Urban	0	0	2	0	9	0	0	0	0	**11**	0.0	0.0	18.2	0.0	81.8	0.0	0.0	0.0	0.0

LATE ROMAN SITES continued																						
Site name	County	Site Group	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Chapperton Down	Wiltshire	Rural - minor	0	0	1	0	7	4	1	0	1	**14**	0.0	0.0	7.1	0.0	50.0	28.6	7.1	0.0	7.1
Kilverstone	Norfolk	Rural - minor	0	0	2	1	1	1	6	1	2	**14**	0.0	0.0	14.3	7.1	7.1	7.1	42.9	7.1	14.3
Monk Sherborne	Hampshire	Rural - minor	0	1	2	4	0	0	3	5	0	**15**	0.0	6.7	13.3	26.7	0.0	0.0	20.0	33.3	0.0
Catterick, all sites	North Yorkshire	Rural - nucleated	0	2	7	7	0	1	3	0	0	**20**	0.0	10.0	35.0	35.0	0.0	5.0	15.0	0.0	0.0
Wayside Farm	Wiltshire	Rural - minor	0	0	3	4	3	5	5	1	0	**21**	0.0	0.0	14.3	19.0	14.3	23.8	23.8	4.8	0.0
Batten Hanger	West Sussex	Rural - minor	0	4	0	4	9	10	2	0	0	**29**	0.0	13.8	0.0	13.8	31.0	34.5	6.9	0.0	0.0
Silchester, insula IX	Hampshire	Urban	1	1	1	2	9	10	4	1	0	**29**	3.4	3.4	3.4	6.9	31.0	34.5	13.8	3.4	0.0
Newquay, Atlantic Road	Cornwall	Rural - minor	0	0	1	4	5	10	10	1	2	**33**	0.0	0.0	3.0	12.1	15.2	30.3	30.3	3.0	6.1
Hacheston	Suffolk	Rural - nucleated	0	0	10	11	9	0	7	0	0	**37**	0.0	0.0	27.0	29.7	24.3	0.0	18.9	0.0	0.0
Dalton Parlours	West Yorkshire	Rural - minor	7	4	7	6	5	2	3	2	2	**38**	18.4	10.5	18.4	15.8	13.2	5.3	7.9	5.3	5.3
Castleford	West Yorkshire	Rural - nucleated	0	10	4	8	11	4	0	3	1	**41**	0.0	24.4	9.8	19.5	26.8	9.8	0.0	7.3	2.4
Braughing	Hertfordshire	Rural - nucleated	0	3	5	5	6	0	24	0	0	**43**	0.0	7.0	11.6	11.6	14.0	0.0	55.8	0.0	0.0
Elms Farm	Essex	Rural - minor	0	1	8	15	15	4	8	2	1	**54**	0.0	1.9	14.8	27.8	27.8	7.4	14.8	3.7	1.9
Caistor-on-sea	Norfolk	Military	1	4	16	15	2	1	1	2	13	**55**	1.8	7.3	29.1	27.3	3.6	1.8	1.8	3.6	23.6
Silchester, forum-basilica	Hampshire	Urban	0	12	1	14	12	10	12	0	0	**61**	0.0	19.7	1.6	23.0	19.7	16.4	19.7	0.0	0.0
Claydon Pike, Longdole's Field	Gloucestershire	Rural - minor	0	2	3	9	26	13	19	0	0	**72**	0.0	2.8	4.2	12.5	36.1	18.1	26.4	0.0	0.0
Stonea	Cambridgeshire	Rural - minor	1	9	17	13	11	15	13	6	1	**86**	1.2	10.5	19.8	15.1	12.8	17.4	15.1	7.0	1.2
Bancroft	Buckinghamshire	Rural - minor	1	4	7	19	18	16	20	1	4	**90**	1.1	4.4	7.8	21.1	20.0	17.8	22.2	1.1	4.4
Chichester, Cattlemarket	West Sussex	Urban	0	4	7	16	22	27	13	8	1	**98**	0.0	4.1	7.1	16.3	22.4	27.6	13.3	8.2	1.0
Gussage All Saints	Dorset	Rural - minor	0	0	28	21	5	42	0	4	0	**100**	0.0	0.0	28.0	21.0	5.0	42.0	0.0	4.0	0.0
Owslebury	Hampshire	Rural - minor	0	7	14	18	5	23	22	11	0	**100**	0.0	7.0	14.0	18.0	5.0	23.0	22.0	11.0	0.0
Grandford	Cambridgeshire	Rural - nucleated	0	0	4	8	19	33	31	5	0	**100**	0.0	0.0	4.0	8.0	19.0	33.0	31.0	5.0	0.0
Baldock	Hertfordshire	Rural - nucleated	0	7	23	32	4	3	18	13	0	**100**	0.0	7.0	23.0	32.0	4.0	3.0	18.0	13.0	0.0
Dragonby	Lincolnshire	Rural - nucleated	2	1	7	2	4	20	4	18	42	**100**	2.0	1.0	7.0	2.0	4.0	20.0	4.0	18.0	42.0
Piercebridge, large vicus building	Durham	Rural - nucleated	0	2	9	59	6	12	12	0	0	**100**	0.0	2.0	9.0	59.0	6.0	12.0	12.0	0.0	0.0
Piercebridge, outer ditch	Durham	Rural - nucleated	0	0	7	35	28	4	26	0	0	**100**	0.0	0.0	7.0	35.0	28.0	4.0	26.0	0.0	0.0
Dorchester, Greyhound Yard	Dorset	Urban	1	7	6	25	43	11	7	0	0	**100**	1.0	7.0	6.0	25.0	43.0	11.0	7.0	0.0	0.0
Lincoln	Lincolnshire	Urban	0	4	0	15	29	33	15	2	2	**100**	0.0	4.0	0.0	15.0	29.0	33.0	15.0	2.0	2.0
Piercebridge, inner ditch	Durham	Military	0	0	3	10	34	8	45	0	0	**100**	0.0	0.0	3.0	10.0	34.0	8.0	45.0	0.0	0.0
		TOTAL	**1**	**5**	**11**	**20**	**19**	**18**	**18**	**5**	**4**	**1929**	**1**	**6**	**12**	**19**	**20**	**16**	**17**	**5**	**4**

Appendix A.VII; Records of bird remains ('wetland' group) by phase and site type

Avian Taxa codes:

Duck sp.	Mallard	Teal	Wigeon	Goose	Moorhen	Woodcock	Godwit	Curlew	Snipe	Plover	Mute Swan	Common Crane	Grey Heron	Guillemot	Cormorant	Pochard	Tufted Duck	Gull
DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU

Site	Avian taxa																	
Middle Iron Age - Rural minor	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Appleford																			
Ashville Trading Estate		5												1					
Aston Mill Farm																			
Biddenham Loop																			
Blackhorse Road																			
Bramdean																			
Brighton Hill																			
Chilbolton Down																			
Claydon Pike, Warrens Field																			
Dolland's Moor																			
Easton Lane																			
Eldon's Seat																			
Farmoor																			
Gravelly Guy		5			1									5					
Groundwell Farm					1								1						
Hawk's Hill																			
Houghton Down (Hamilton)			1	2															
Kingsmead South																			
Market Deeping	2				1							1							
Micheldever Wood		3					1												
Old Down Farm																			
Owslebury																			
Rooksdown																			
Slonk Hill																			
Spratsgate Lane																			
Suddern Farm		2																	

Middle Iron Age - Rural minor (continued)	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Thorpes Thewles					2														
Weekley		1																	
Winnall Down	1	3			1									3					
Middle Iron Age - Rural - nucleated																			
Bury Hill										2									
Bury Wood Camp					3														
Conderton Camp					2						1								
Danebury	6	11		1	8		3				2	1		2		4		1	
Dragonby					1														
Maiden Castle																			
Uley Bury																			
Winklebury Camp																			
Late Iron Age - Rural - minor																			
Abbeymead																			
Ashville Trading Estate		4																	
Balksbury Camp		8			1									6					
Barton Court Farm		1																	
Bicester Fields Farm																			
Biddenham Loop																			
Billingborough		1			3								15						
Birdlip																			
Bishopstone																			2
Blackthorn																			
Brighton Hill											1								
Chignall																			
Clay Lane																			
Copse Farm																			
Dalton Parlours																			
Dolland's Moor																			
Easton Lane																			

Late Iron Age - Rural – minor (continued)	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Edix Hill																			
Farningham Hill																			
Fishbourne, east (1995-2002)					4														1
Flagstones							1												
Frocester																			
Gorhambury																			
Grateley South																			
Haddenham V	31	177	14		32		1					267	3	2		1	3	1	4
Haddenham VI		3	2	1															
Hallen													1						
Houghton Down (Hammon)																			
Little Oakley																			
Little Somborne																			
Mingies Ditch		1									1								
Moulton Park																			
Nettlebank Copse																			
North Bersted																			
North Shoebury	1																		
Orton Longueville																			
Owslebury																			
Oxley Park West																			
Rucstalls																			
Runfold																			
Suddern Farm		1		1															
Thorpe Lea																			
Thorpes Thewles																			
Thruxton					1														
Tolpuddle Ball																			
Tort Hill West																			
Travelegue																			
Wardy Hill	12				2		1					1	1						
Watkins Farm																			
Weekley		2																	

Late Iron Age - Rural – minor (continued)	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
West Stow					5								3	1					
Worth Maltravers, Compact Farm					1	1													
Late Iron Age - Rural - nucleated																			
Cadbury Congresbury																			
Coygan Camp																			
Danebury					1														
Dragonby		1			1														
Grimthorpe																			
Silchester		2					5												
Sutton Walls																			
Uley Bury																			
Late Iron Age - Religious																			
Bancroft, temple-mausoleum																			
Haddenham IV		2										1							
Uley Shrines																			
Witham																			
IA/RB transition - Rural - minor																			
Abbotstone Down																			
Barton Court Farm																			
Birdlip																			
Brighton Hill																			
Burgh		4											1						
Carne's Seat	1																		
Claydon Pike, Longdole's Field		3			6														
Copse Farm																			
Easton Lane																			
Elms Farm																			

IA/RB transition - Rural – minor (continued)	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Fishbourne, Westward House																			
Frocester																			
Gravelly Guy		8			6														
Haddon																			
Houghton Down (Hamilton)			1																
Keston																			
Lavant																			
Martin																			
Micheldever Wood																			
Neigh Bridge																			
Northwick																			
Old Down Farm	2		1																
Orton Longueville																			
Ounces Barn																			
Owslebury		1					1			1									
Rooksdown	3																		
Suddern Farm																			
Tolpuddle Ball																			
Twyford Down																			
Wavendon Gate																			
Whitcombe																			
Winnall Down																			
Woolbury																			
Yarford																			
IA/RB transition - Rural - nucleated																			
Braughing																			
Ditches		1			1														
Silchester		8			7		1												
Silchester, defences																			
Skeleton Green		5																	

IA/RB transition - Religious	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Bancroft, temple-mausoleum																			
Hayling Island																			
Uley Shrines			1																
Early Roman - Rural - minor																			
Appleford																			
Bancroft							1	1											
Barton Court Farm					1														
Biddenham Loop	1																		
Billingborough																			
Bishopstone																			
Blackhorse Road																			
Castle Copse	2	1					6				2								
Charlton Kings					1														
Chelmsford, mansio site AR																			
Chignall		2																	
Clay Lane																			
Claydon Pike, Longdole's Field	6	6			11					1				2					
Cowbit																			
Dolland's Moor																			
Elms Farm		9			1		1				1	1							
Elstead																			
Empingham		2			3														
Fishbourne, east (1995-2002)	4	22	1	1	7	3	7						1						14
Fishbourne, Palace (1960-68)	12	81	4		24		5	1					9					1	
Frocester	2	1	1		1				1										
Fullerton	1	1					2				1								
Gorhambury	1	20	2		11		8						2						
Grateley South	1																		
Haddon	1	3	1	1															
Haymes																			
Hengistbury Head																			
Houghton Down (Hammon)																			
Kelvedon																			

Early Roman - Rural – minor (continued)	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Kilverstone																			
Little Oakley																			
Little Somborne																			
Manor Farm																			
Mount Roman villa																			
Nash																			
Newhaven																			
Newquay, Atlantic Road					5										1				
Orton Hall Farm		3			2														
Orton Longueville																			
Owslebury																			
Parnwell		1			1					1									
Pasture Lodge Farm		3			8						1	1							
Peene																			
Rucstalls																			
Runfold																			
Tewkesbury																			
Thorpe Lea																			
Thruxton																			
Tort Hill East																			
Tort Hill West																			
Watkins Farm																			
Wavendon Gate					3														
Weekley												1	1						
West Stow		1			2														
Whelford Bowmoor																			
Whitton																			
Winnall Down																			
Worth Maltravers, Compact Farm				1															

Early Roman - Rural - nucleated	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Alcester		1																	
Alcester, AES 76-7		1					1												
Asthall	1																		
Braughing																			
Carlisle, The Lanes		1			5								1						
Castleford																			
Catterick, Catterick Bridge																			
Chelmsford, site AA																			
Chelmsford, site S																			
Cirencester (Thawley)																			
Conderton Camp																			
Dragonby		1			2								1						
Droitwich, Hanbury Street																			
Grandford		5																	
Hacheston																			
Neatham																			
Norbury Camp																			
Poundbury																			
Shepton Mallet	1																		
Wilcote																			
Worcester, Deansway					4		1												
Worcester, Sidbury		1											1						
Early Roman - Urban																			
Canterbury Castle																			
Chichester, Cattlemarket		9			3														
Chichester, Rowes Garage																			
Cirencester (Maltby)		13	7	1	5		3				1								
Colchester, Balkerne Heights		5			2		1		1										
Colchester, Balkerne Lane		10																	
Colchester, Culver Street		59			13														
Colchester, Gilberd School		106			22														
Colchester, Sheepen		19		1	6			1					2						

Early Roman – Urban (continued)	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Dorchester, County Hall	2						2												
Dorchester, County Hospital		1		5			2												
Dorchester, Greyhound Yard	31	70	3		9		31				1		2						
Dorchester, South Grove cottage																			
Exeter		4			1		9		1				2						
Ilchester	18		5		2														
Leicester, Little Lane	5				9							1							
Lincoln		1																	
Silchester, defences																			
Silchester, forum basilica		7			4		7												
Southwark, Winchester Palace																			
Wroxeter, baths and macellum	1	2			7		15												
York, General Accident site		34	2	1	130		3				5	2						3	
Early Roman - Military																			
Alchester	2				2														
Birdoswald							1												
Brancaster		4			2		1												
Caerleon, baths	4				11														
Caerleon, scamnum tribunorum	39				7		1						62						
Caistor-on-sea					3														
Droitwich, Dodderhill																			
Hod Hill		1					1												
Loughor		3			9		21												
Ribchester		1			1							3							
Wallsend					5								1						
Wroxeter, fortress	3	5			2		18				1	1							
Early Roman - Religious																			
Chelmsford, temple site		3					1												
Haddenham III, Snow's Farm	1	1	1		1									1		1			

Early Roman – Religious (continued)	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Hayling Island																			
Rocester																			
Slonk Hill																			
St Albans, Folly Lane		3																	
Uley Shrines		1	4		1		2				2								
Witham																			
Late Roman - Rural - minor																			
Ashville Trading Estate																			
Avonmouth																			
Bancroft		22	1		38		4	3				1		7					1
Barnsley Park	20	10		4	7		1	4		1	9						5		
Barton Court Farm		11			16						1								
Batten Hanger																			
Bignor																			
Castle Copse	29	129	6		29		34			1	58								
Chapperton Down	1																		
Chignall		1																	
Chilgrove 2																			
Claydon Pike, Longdole's Field	2	13	1		32					2		1	3						
Dalton Parlours																			
Dolland's Moor																			
Droitwich, Bays Meadow		22		1	5		28				5								
Duckpool																			
Elms Farm		14			2		3		1		2								
Empingham North					4														
Empingham North, well					12		1												
Farmoor																			
Fishbourne, east (1995-2002)		5																	
Fishbourne, Harbour																			
Fishbourne, Palace (1960-68)	1	3			2												1		
Fishbourne, Westward House																			
Frocester	4	6	3		6				1										

Late Roman - Rural - minor (continued)	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Gorhambury	1	1			1														
Great Holts Farm		7			8		22				1								
Haddon																			
Houghton Down (Hammon)																			
Kelvedon																			
Keston																			
Kilverstone																			
Little Somborne																			
Minchin Hole Cave																			
Monk Sherborne																			
Newquay, Atlantic Road					1														
North Shoebury					2														
Orton Hall Farm		6			3							1							
Orton Longueville																			
Owslebury	1	5																	
Pasture Lodge Farm	1	8		1	6		3				4	1							
Portway																			
Poxwell					1														
Ranscombe Hill																			
Renner's Park, well																			
Rucstalls																			
Shadwell	3																		
Shakenoak																			
Stonea																			
Thorpe Lea																			
Tort Hill East																			
Wainscott																			
Watergate																			
Wavendon Gate					1														
Wayside Farm																			
Whitcombe																			
Worplesdon																			
Yarford	5	1					8				2								

Late Roman - Rural - nucleated	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Alcester		8	1		15		22				1								
Alcester, defences		1			3		2												
Asthall	1																		
Baldock																			
Braughing																			
Carlisle, The Lanes					1														
Catterick, Bainesse	1				1						1								
Catterick, Catterick Bridge																			
Catterick, Thornbrough Farm					1														
Chelmsford, site S																			
Chelmsford, site T																			
Coygan Camp		1																	
Dragonby		3			3								1						
Droitwich, Hanbury Street					2														
Grandford		5	1																
Great Dumnow																			
Hacheston			1		1		1				1								
Kingscote																			
Neatham	1				3														
Piercebridge, large vicus building		5			70							1							
Piercebridge, outer ditch	3				22						1		1						
Poundbury																			
Worcester, Deansway					2														
Worcester, Sidbury					2		2												
Late Roman - Urban																			
Caerwent	3	3			2		1												
Chichester, Cattlemarket		9			7		4												
Chichester, Lavant Culvert																			
Cirencester (Maltby)		50	6		20	2	11												
Colchester, Balkerne Lane		90			17														
Colchester, Culver Street		104			84														

Late Roman – Urban (continued)	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Dorchester, County Hall	1						1												
Dorchester, County Hospital																			
Dorchester, Greyhound Yard	63	115	6		10		29			1									
Dorchester, South Grove cottage																			
Exeter		9	2		8		30												
Ilchester	32		13		24														
Ilchester, Great Yard																			
Lincoln	2	39			28	1					1		2				1		
London, Walbrook Mithraeum	2	4			1		1												
Silchester, defences		4									1								
Silchester, forum-basilica		14			97		19				1								
Silchester, insula IX	6				8		5												
Southwark, Winchester Palace																			
Wroxeter, baths and macellum		2			7		7												
York, General Accident site		4			5								1						
Late Roman - Military																			
Birdoswald																			
Brancaster							1												
Burgh Castle																			
Caerleon, baths					2														
Caernarfon		7	1		34		3				3								2
Caistor-on-sea	3	108	13	2	51		7				3	1	1						2
Carr Naze	4	13	1		8		2		1						10	1			1
Piercebridge, inner ditch		5			17						1								
Portchester	1	58	2	1	3		1												3

Late Roman - Religious	DK	ML	TL	WN	GE	MN	WK	GT	CW	SE	PL	MS	CE	GH	GL	CT	PD	TD	GU
Brigstock																			
Chelmsford, temple site							1												
Henley Wood																			
Lowbury Hill																			
St Albans, Folly Lane					1														
Uley Shrines		2	13				26			1	3								
Witham																			

Appendix A.VIII; Records of bird remains ('other wildfowl' group) by phase and site type

Avian taxa codes:

Corncrake	Pheasant	Partridge	Pigeon	Wagtail	Thrush	Sparrow	Swallow	Crow/ Rook	Magpie	Jackdaw	Raven	Kestrel	Buzzard	Red kite	Sea (w-t) eagle	Goshawk
CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH

Site	Avian taxa															
Middle Iron Age - Rural minor	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Appleford																	
Ashville Trading Estate											1						
Aston Mill Farm																	
Biddenham Loop																	
Blackhorse Road						1											
Bramdean																	
Brighton Hill																	
Chilbolton Down																	
Claydon Pike, Warrens Field														1			
Dolland's Moor																	
Easton Lane														1			
Eldon's Seat																	
Farmoor																	
Gravelly Guy									1			5					
Groundwell Farm												2		4			
Hawk's Hill																	
Houghton Down (Hamilton)									18			1			5		
Kingsmead South																	
Market Deeping																	
Micheldever Wood									1								
Old Down Farm												2					
Owslebury									5		2			19			
Rooksdown									1			76					
Slonk Hill																	
Spratsgate Lane																	
Suddern Farm									4			1					

Middle Iron Age - Rural minor (continued)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Thorpes Thewles																	
Weekley																	
Winnall Down						8											
Middle Iron Age - Rural - nucleated																	
Bury Hill													1				
Bury Wood Camp																	
Conderton Camp						1			1			2		2			
Danebury			2			1	4		32			176		11			
Dragonby												14				2	
Maiden Castle																	
Uley Bury																	
Winklebury Camp												27					
Late Iron Age - Rural - minor																	
Abbeymead																	
Ashville Trading Estate																	
Balksbury Camp												15					
Barton Court Farm									1					2			
Bicester Fields Farm																	
Biddenham Loop																	
Billingborough									1			2		1			
Birdlip																	
Bishopstone																	
Blackthorn																	
Brighton Hill																	
Chignall																	
Clay Lane																	
Copse Farm									2								
Dalton Parlours																	
Dolland's Moor																	
Easton Lane																	

Late Iron Age - Rural – minor (continued)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Edix Hill																	
Farningham Hill																	
Fishbourne, east (1995-2002)																	
Flagstones																	
Frocester																	
Gorhambury											2						
Grateley South						3	1		1						2		
Haddenham V						1			4			1		1		3	
Haddenham VI																	
Hallen																	
Houghton Down (Hammon)																	
Little Oakley																	
Little Somborne									10								
Mingies Ditch						1	1										
Moulton Park																	
Nettlebank Copse												1	21		1		
North Bersted																	
North Shoebury																	
Orton Longueville																	
Owslebury						47	16		38			8					
Oxley Park West																	
Rucstalls																	
Runfold																	
Suddern Farm									8			11		15			
Thorpe Lea																	
Thorpes Thewles																	
Thruxton																	
Tolpuddle Ball																	
Tort Hill West																	
Travelegue																	
Wardy Hill						1			2			3		1			
Watkins Farm																	
Weekley			1									1					

Late Iron Age - Rural – minor (continued)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
West Stow																	
Worth Maltravers, Compact Farm																	
Late Iron Age - Rural - nucleated																	
Cadbury Congresbury																	
Coygan Camp																	
Danebury									4								
Dragonby									12			69		1	2	51	4
Grimthorpe																	
Silchester												3					
Sutton Walls																	
Uley Bury																	
Late Iron Age - Religious																	
Bancroft, temple-mausoleum																	
Haddenham IV																	
Uley Shrines																	
Witham																	
IA/RB transition - Rural - minor																	
Abbotstone Down																	
Barton Court Farm																	
Birdlip																	
Brighton Hill												1					
Burgh												4					
Carne's Seat																	
Claydon Pike, Longdole's Field				1		2						2					
Copse Farm												1					
Easton Lane																	
Elms Farm																	
Fishbourne, Westward House																	
Frocester									1								

IA/RB transition - Rural – minor (continued)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Gravelly Guy																	1
Haddon																	
Houghton Down (Hamilton)											1						
Keston																	
Lavant																	
Martin																	
Micheldever Wood																	
Neigh Bridge																	
Northwick																	
Old Down Farm																	
Orton Longueville																	
Ounces Barn																	
Owslebury						5			29			43		5			
Rooksdown														1			
Suddern Farm									1								
Tolpuddle Ball																	
Twyford Down																	
Wavendon Gate																	
Whitcombe																	
Winnall Down																	
Woolbury																	
Yarford																	
IA/RB transition - Rural - nucleated																	
Braughing																	
Ditches						1											
Silchester												33					
Silchester, defences												2					
Skeleton Green									2			33					
IA/RB transition - Religious																	
Bancroft, temple-mausoleum																	

IA/RB transition – Religious (continued)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Hayling Island																	
Uley Shrines							1										
Early Roman - Rural - minor																	
Appleford																	
Bancroft																	
Barton Court Farm									1								
Biddenham Loop																	
Billingborough																	
Bishopstone																	
Blackhorse Road												1					
Castle Copse						2											3
Charlton Kings																	
Chelmsford, mansio site AR																	
Chignall																	
Clay Lane																	
Claydon Pike, Longdole's Field						2			4								
Cowbit																	
Dolland's Moor																	
Elms Farm												4					
Elstead																	
Empingham						1	1	2	1						1		
Fishbourne, east (1995-2002)				7		6											
Fishbourne, Palace (1960-68)				5		1						1				1	
Frocester				3		1			1						5		
Fullerton						1	1		7								
Gorhambury						7			2		1						
Grateley South				3		1											
Haddon												5					
Haymes																	
Hengistbury Head																	
Houghton Down (Hammon)																	
Kelvedon																	

Early Roman - Rural – minor (continued)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Kilverstone																	
Little Oakley																	
Little Somborne									5								
Manor Farm																	
Mount Roman villa																	
Nash																	
Newhaven																	
Newquay, Atlantic Road						1											
Orton Hall Farm									3					1			
Orton Longueville																	
Owslebury						1	1		56			1					
Parnwell									1								
Pasture Lodge Farm									3							1	
Peene																	
Rucstalls																	
Runfold																	
Tewkesbury																	
Thorpe Lea																	
Thruxton																	
Tort Hill East									1								
Tort Hill West																	
Watkins Farm																	
Wavendon Gate																	
Weekley																	
West Stow																	
Whelford Bowmoor																	
Whitton																	
Winnall Down									1			1					
Worth Maltravers, Compact Farm																	

Early Roman - Rural – nucleated (continued)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Alcester																	
Alcester, AES 76-7												6					
Asthall									1			1					
Braughing																	
Carlisle, The Lanes																1	
Castleford																	
Catterick, Catterick Bridge																	
Chelmsford, site AA																	
Chelmsford, site S																	
Cirencester (Thawley)																	
Conderton Camp						1											
Dragonby												12		1	1	8	1
Droitwich, Hanbury Street																	
Grandford									1								
Hacheston																	
Neatham																	
Norbury Camp																	
Poundbury																	
Shepton Mallet									1								
Wilcote																	
Worcester, Deansway												1					
Worcester, Sidbury																	
Early Roman - Urban																	
Canterbury Castle																	
Chichester, Cattlemarket									5		4	5					
Chichester, Rowes Garage																	
Cirencester (Maltby)									2			2					
Colchester, Balkerne Heights												1					
Colchester, Balkerne Lane																	
Colchester, Culver Street																	
Colchester, Gilberd School																	
Colchester, Sheepen	1											28				19	

Early Roman – Urban (continued)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Dorchester, County Hall				2													
Dorchester, County Hospital				1		1											
Dorchester, Greyhound Yard				66					60		58	158					
Dorchester, South Grove cottage																	
Exeter				2		2					2	13					
Ilchester																	
Leicester, Little Lane												16					
Lincoln																	
Silchester, defences																	
Silchester, forum basilica				3							3	2					
Southwark, Winchester Palace																	
Wroxeter, baths and macellum												3					
York, General Accident site				3			3		3		1						
Early Roman - Military																	
Alchester																	
Birdoswald				6	1		1										
Brancaster												15		1			
Caerleon, baths																	
Caerleon, scamnum tribunorum																3	
Caistor-on-sea												2					
Droitwich, Dodderhill																	
Hod Hill				1													
Loughor				2					2								
Ribchester				1								15			2		
Wallsend						1	1										
Wroxeter, fortress				2					3		1	4		1			
Early Roman - Religious																	
Chelmsford, temple site																	
Haddenham III, Snow's Farm						1			1					1		1	
Hayling Island																	

Early Roman – Religious (continuous)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Rocester																	
Slonk Hill																	
St Albans, Folly Lane				1		1			6								
Uley Shrines							1				1	2				2	
Witham																	
Late Roman - Rural - minor																	
Ashville Trading Estate																	
Avonmouth						1											
Bancroft			1	2						1		1					
Barnsley Park		16	3						1								
Barton Court Farm									3		6		1	4			
Batten Hanger																	
Bignor																	
Castle Copse						22	2		2		4						
Chapperton Down																	
Chignall																	
Chilgrove 2																	
Claydon Pike, Longdole's Field				2		2				1				1			
Dalton Parlours																	
Dolland's Moor																	
Droitwich, Bays Meadow				20		1			1			4				8	
Duckpool																	
Elms Farm												4					
Empingham North				1		2											
Empingham North, well						1			1								
Farmoor	1																
Fishbourne, east (1995-2002)				1													
Fishbourne, Harbour																	
Fishbourne, Palace (1960-68)																	
Fishbourne, Westward House																	
Frocester				3		6			10					1			
Gorhambury				2		1			2								

Late Roman - Rural – minor (continued)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Great Holts Farm						131											
Haddon																	
Houghton Down (Hammon)																	
Kelvedon																	
Keston																	
Kilverstone																	
Little Somborne									52								
Minchin Hole Cave																	
Monk Sherborne						1						3					
Newquay, Atlantic Road																	
North Shoebury									1					1			
Orton Hall Farm												3					
Orton Longueville																	
Owslebury				1		7	42		27			15		85			
Pasture Lodge Farm									1								
Portway																	
Poxwell																	
Ranscombe Hill																	
Renner's Park, well																	
Rucstalls																	
Shadwell																	
Shakenoak																	
Stonea																	
Thorpe Lea																	
Tort Hill East																	
Wainscott																	
Watergate																	
Wavendon Gate									1								
Wayside Farm																	
Whitcombe																	
Worplesdon																	
Yarford				1		1			1								

Late Roman - Rural - nucleated	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Alcester				2							4	26					
Alcester, defences				3			2		1			3					
Asthall									2			2					
Baldock																	
Braughing																	
Carlisle, The Lanes												11					
Catterick, Bainesse				1					1		1	1				1	
Catterick, Catterick Bridge																	
Catterick, Thornbrough Farm						1			1		2	1					
Chelmsford, site S																	
Chelmsford, site T																	
Coygan Camp																	
Dragonby									37			9			1		
Droitwich, Hanbury Street									1								
Grandford									4								
Great Dumnow																	
Hacheston												10					
Kingscote							1										
Neatham																	
Piercebridge, large vicus building									1		1						
Piercebridge, outer ditch									1					17			
Poundbury																	
Worcester, Deansway												1					
Worcester, Sidbury												2					
Late Roman - Urban																	
Caerwent									1			1			8		
Chichester, Cattlemarket									5		5	2					
Chichester, Lavant Culvert																	
Cirencester (Maltby)				1		1		10				2		1			
Colchester, Balkerne Lane																	
Colchester, Culver Street																	
Dorchester, County Hall				1													

Late Roman – Urban (continued)	CC	PT	PE	PN	WL	TH	SP	SW	CR	MG	JW	RN	KS	BZ	RK	WE	GH
Dorchester, County Hospital																	
Dorchester, Greyhound Yard	1			11		1			14		9	92		2			
Dorchester, South Grove cottage																	
Exeter			1	4		4			2		5	2					
Ilchester																	
Ilchester, Great Yard																	
Lincoln												4					
London, Walbrook Mithraeum												1					
Silchester, defences			1														
Silchester, forum-basilica				8			9				3						
Silchester, insula IX						6					26	5					
Southwark, Winchester Palace																	
Wroxeter, baths and macellum				2								11					
York, General Accident site							1										
Late Roman - Military																	
Birdoswald				5													
Brancaster												1					
Burgh Castle																	
Caerleon, baths																	
Caernarfon				3					2			10				6	
Caistor-on-sea				1					2			19				1	
Carr Naze				2		23	8				3						
Piercebridge, inner ditch									4	6		1		1			
Portchester			2								7	29	1				
Late Roman - Religious																	
Brigstock																	
Chelmsford, temple site																	
Henley Wood																	
Lowbury Hill																	
St Albans, Folly Lane												1					
Uley Shrines						6				1	1						
Witham																	

Appendix A.IXi; Presence of fish species with %occurence across all sites by period which included fish remains (Roach – Gadid sp.)

Site name	Site group	Fish taxa												
Middle Iron Age (n=5)		**Roach**	**Cyprinid**	**Perch**	**Pike**	**Trout**	**Salmon**	**Eel**	**Smelt**	**Herring**	**Makerel**	**Cod**	**Haddock**	**Gadid**
Gravelly Guy	Rural - minor													
Conderton Camp	Rural - nucleated													
Danebury	Rural - nucleated													
Maiden Castle	Rural - nucleated					Y								
Winklebury Camp	Rural - nucleated													
	%Representation	**0**	**0**	**0**	**0**	**20**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Late Iron Age (n=12)														
Balksbury Camp	Rural - minor													
Bishopstone	Rural - minor													
Fishbourne, east (1995-2002)	Rural - minor													
Haddenham V	Rural - minor		Y		Y									
Owslebury	Rural - minor													
Wardy Hill	Rural - minor				Y									
Watkins Farm	Rural - minor				Y									
Wavendon Gate	Rural - minor													
Dragonby	Rural - nucleated				Y		Y	Y						
Silchester	Rural - nucleated						Y							
Sutton Walls	Rural - nucleated													
Haddenham IV	Religious				Y									
	%Representation	**0**	**8**	**0**	**42**	**0**	**17**	**8**	**0**	**0**	**0**	**0**	**0**	**0**
IA/RB transition (n=10)														
Gravelly Guy	Rural - minor													
Thetford	Rural - minor							Y		Y				
Wavendon Gate	Rural - minor													
Yarford	Rural - minor						Y							
Braughing	Rural - nucleated							Y						
Ditches	Rural - nucleated													
Southwark, Southwark Cathedral	Rural - nucleated											Y		
Dorchester, Greyhound Yard	Urban						Y							
London, Fleet Valley	Urban													

Site name	Site group	Fish taxa												
IA/RB transition (n=10) continued		**Roach**	**Cyprinid**	**Perch**	**Pike**	**Trout**	**Salmon**	**Eel**	**Smelt**	**Herring**	**Makerel**	**Cod**	**Haddock**	**Gadid**
London, Leadenhall Court	Urban	Y	Y				Y	Y	Y	Y	Y	Y		Y
	%Representation	**10**	**10**	**0**	**0**	**0**	**30**	**30**	**10**	**20**	**10**	**20**	**0**	**10**
Early Roman (n=49)														
Bishopstone	Rural - minor													
Castle Copse	Rural - minor													
Claydon Pike, Longdole's Field	Rural - minor													
Dickson's Corner	Rural - minor											Y		
Fishbourne, east (1995-2002)	Rural - minor							Y		Y		Y		
Gorhambury	Rural - minor		Y				Y	Y		Y				
Meppershall	Rural - minor		Y					Y		Y				
Mount Roman villa	Rural - minor													
Parnwell	Rural - minor													
Scotney Court	Rural - minor												Y	
Winnall Down	Rural - minor							Y						
Carlisle, The Lanes	Rural - nucleated				Y	Y	Y	Y			Y	Y	Y	Y
Dragonby	Rural - nucleated						Y							
Godmanchester	Rural - nucleated	Y	Y	Y	Y			Y		Y				
Skeleton Green	Rural - nucleated	Y						Y						
Southwark, 1-7 St Thomas Sreet	Rural - nucleated		Y		Y			Y	Y	Y	Y		Y	Y
Southwark, 199 Borough High Street	Rural - nucleated		Y					Y	Y					
Southwark, Calverts buildings	Rural - nucleated		Y					Y	Y	Y				
Southwark, Long Lane	Rural - nucleated	Y										Y		
Southwark, Swan Street	Rural - nucleated											Y		
Worcester, Deansway	Rural - nucleated											Y		
Worcester, Sidbury	Rural - nucleated											Y		
Colchester, Balkerne Heights	Urban													
Colchester, former post office	Urban										Y			
Colchester, Gilberd School	Urban													
Dorchester, County hall	Urban							Y						
Dorchester, Greyhound Yard	Urban							Y						Y

Site name	Site group	Fish taxa												
Early Roman (n=49) continued		Roach	Cyprinid	Perch	Pike	Trout	Salmon	Eel	Smelt	Herring	Makerel	Cod	Haddock	Gadid
Exeter	Urban													
London, 2-5 Devonshire Square	Urban										Y	Y		
London, Billingsgate buildings	Urban			Y								Y		Y
London, Billingsgate fish market	Urban						Y	Y			Y			
London, Rangoon Street	Urban							Y	Y	Y				
Silchester, forum-basilica	Urban		Y				Y							
York, Fishergate	Urban			Y	Y			Y		Y			Y	
York, General Accident site	Urban				Y		Y							
York, St Mary Bishophill Junior	Urban									Y				
Birdoswald	Military						Y							
Caerleon, scamnum tribunorum	Military													
Carlisle, Castle Street	Military						Y	Y			Y			
Chester, Dee House	Military						Y	Y	Y					
Droitwich, Dodderhill	Military						Y							
Exeter	Military													
Loughor	Military									Y		Y		
Ribchester	Military		Y				Y	Y	Y					
Wallsend	Military													
Haddenham III, Snow's Farm	Religious		Y	Y	Y									
Slonk Hill	Religious													
St Albans, Folly Lane	Religious		Y					Y	Y					
Uley Shrines	Religious					Y	Y	Y						
	%Representation	6	20	8	12	4	25	41	14	20	12	20	8	8
Late Roman (n=38)														
Beddington, well	Rural - minor									Y				
Bignor	Rural - minor							Y						
Castle Copse	Rural - minor													
Gorhambury	Rural - minor							Y						
Great Holts Farm	Rural - minor				Y			Y		Y				
Orton Hall Farm	Rural - minor													

Site name	Site group	Fish taxa												
Late Roman (n=38) continued		Roach	Cyprinid	Perch	Pike	Trout	Salmon	Eel	Smelt	Herring	Makerel	Cod	Haddock	Gadid
Owslebury	Rural - minor							Y		Y				
Shadwell	Rural - minor											Y		
Yarford	Rural - minor						Y							
Alcester	Rural - nucleated				Y	Y	Y							
Catterick, Thornbrough Farm	Rural - nucleated									Y				
Coygan Camp	Rural - nucleated													
Dragonby	Rural - nucleated						Y							
Southwark, Babe Ruth Bathouse	Rural - nucleated		Y							Y	Y			
Southwark, Fennings Wharf	Rural - nucleated		Y					Y	Y	Y		Y		Y
Southwark, Kings College	Rural - nucleated													
Southwark, Lefevre Road	Rural - nucleated							Y		Y				
Southwark, Parnell Road	Rural - nucleated				Y			Y	Y	Y				
Southwark, Tobacco Dock	Rural - nucleated							Y		Y				
Worcester, Deansway	Rural - nucleated		Y				Y	Y		Y		Y		
Worcester, Sidbury	Rural - nucleated				Y									
Caerwent	Urban													
Chichester, Chapel Street	Urban													
Colchester, Culver Street	Urban						Y	Y		Y		Y	Y	Y
Dorchester, County hall	Urban		Y					Y						
Dorchester, Greyhound Yard	Urban						Y	Y						Y
Exeter	Urban							Y						Y
Ilchester, Great Yard	Urban		Y	Y				Y						
Lincoln	Urban	Y	Y	Y	Y		Y	Y						
London, Peninsula House	Urban							Y		Y				
Silchester, forum-basilica	Urban													
Silchester, insula IX	Urban		Y		Y		Y	Y	Y					
Wroxeter, baths basilica	Urban	Y	Y	Y	Y		Y				Y			
Carr Naze	Military						Y	Y	Y	Y	Y			Y
Portchester	Military													
Henley Wood	Religious													
St Albans, Folly Lane	Religious													
Uley Shrines	Religious			Y			Y	Y						
	%Representation		5	21	11	18	3	29	50	11	37	8	11	3

Appendix A.IXii; Presence of fish species with %occurence across all sites by period which included fish remains (Ling – Wrasse)

Site name	Site group	Fish taxa											
Middle Iron Age (n=5)		**Ling**	**Sprat**	**Hake**	**Whiting**	**Plaice**	**Flounder**	**Flatfish**	**Mullet**	**Bass**	**Bream**	**Brill**	**Wrasse**
Gravelly Guy	Rural - minor												
Conderton Camp	Rural - nucleated							Y					
Danebury	Rural - nucleated												
Maiden Castle	Rural - nucleated												
Winklebury Camp	Rural - nucleated												
	%Representation	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**0**	**0**	**0**	**0**
Late Iron Age (n=12)													
Balksbury Camp	Rural - minor												
Bishopstone	Rural - minor												
Fishbourne, east (1995-2002)	Rural - minor												
Haddenham V	Rural - minor												
Owslebury	Rural - minor												
Wardy Hill	Rural - minor												
Watkins Farm	Rural - minor												
Wavendon Gate	Rural - minor												
Dragonby	Rural - nucleated												
Silchester	Rural - nucleated												
Sutton Walls	Rural - nucleated												
Haddenham IV	Religious												
	%Representation	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
IA/RB transition (n=10)													
Gravelly Guy	Rural - minor												
Thetford	Rural - minor												
Wavendon Gate	Rural - minor												
Yarford	Rural - minor												
Braughing	Rural - nucleated						Y	Y					
Ditches	Rural - nucleated												
Southwark, Southwark Cathedral	Rural - nucleated												

Site name	Site group	Fish taxa											
IA/RB transition (n=10) continued		**Ling**	**Sprat**	**Hake**	**Whiting**	**Plaice**	**Flounder**	**Flatfish**	**Mullet**	**Bass**	**Bream**	**Brill**	**Wrasse**
Dorchester, Greyhound Yard	Urban									Y	Y		Y
London, Fleet Valley	Urban							Y					
London, Leadenhall Court	Urban				Y			Y	Y				
	%Representation	**0**	**0**	**0**	**10**	**0**	**10**	**30**	**10**	**10**	**10**	**0**	**10**
Early Roman (n=49)													
Bishopstone	Rural - minor												
Castle Copse	Rural - minor												
Claydon Pike, Longdole's Field	Rural - minor												
Dickson's Corner	Rural - minor												
Fishbourne, east (1995-2002)	Rural - minor				Y			Y	Y	Y	Y		
Gorhambury	Rural - minor							Y					
Meppershall	Rural - minor												
Mount Roman villa	Rural - minor												
Parnwell	Rural - minor												
Scotney Court	Rural - minor												
Winnall Down	Rural - minor												
Carlisle, The Lanes	Rural - nucleated												
Dragonby	Rural - nucleated												
Godmanchester	Rural - nucleated							Y					
Skeleton Green	Rural - nucleated												
Southwark, 1-7 St Thomas Sreet	Rural - nucleated												
Southwark, 199 Borough High Street	Rural - nucleated												
Southwark, Calverts buildings	Rural - nucleated												
Southwark, Long Lane	Rural - nucleated							Y					
Southwark, Swan Street	Rural - nucleated												
Worcester, Deansway	Rural - nucleated												
Worcester, Sidbury	Rural - nucleated												
Colchester, Balkerne Heights	Urban					Y							
Colchester, former post office	Urban					Y	Y	Y					
Colchester, Gilberd School	Urban					Y	Y	Y			Y		

Site name	Site group	Fish taxa											
Early Roman (n=49) continued		**Ling**	**Sprat**	**Hake**	**Whiting**	**Plaice**	**Flounder**	**Flatfish**	**Mullet**	**Bass**	**Bream**	**Brill**	**Wrasse**
Dorchester, County hall	Urban												Y
Dorchester, Greyhound Yard	Urban								Y	Y	Y		Y
Exeter	Urban												
London, 2-5 Devonshire Square	Urban												
London, Billingsgate buildings	Urban		Y								Y		
London, Billingsgate fish market	Urban				Y			Y			Y		
London, Rangoon Street	Urban		Y		Y			Y					
Silchester, forum-basilica	Urban							Y	Y	Y	Y		
York, Fishergate	Urban				Y								
York, General Accident site	Urban												
York, St Mary Bishophill Junior	Urban		Y		Y								
Birdoswald	Military												
Caerleon, scamnum tribunorum	Military												
Carlisle, Castle Street	Military			Y		Y	Y	Y	Y				Y
Chester, Dee House	Military							Y					
Droitwich, Dodderhill	Military												
Exeter	Military												
Loughor	Military					Y			Y	Y			
Ribchester	Military					Y	Y		Y				
Wallsend	Military												
Haddenham III, Snow's Farm	Religious												
Slonk Hill	Religious												
St Albans, Folly Lane	Religious							Y				Y	
Uley Shrines	Religious						Y	Y	Y				
	%Representation	**0**	**6**	**2**	**10**	**12**	**10**	**27**	**14**	**8**	**12**	**2**	**6**
Late Roman (n=38)													
Beddington, well	Rural - minor												
Bignor	Rural - minor												
Castle Copse	Rural - minor					Y	Y			Y	Y		
Gorhambury	Rural - minor												
Great Holts Farm	Rural - minor					Y	Y						

Site name	Site group	Fish taxa											
Late Roman (n=38) continued		Ling	Sprat	Hake	Whiting	Plaice	Flounder	Flatfish	Mullet	Bass	Bream	Brill	Wrasse
Orton Hall Farm	Rural - minor												
Owslebury	Rural - minor												
Shadwell	Rural - minor												
Yarford	Rural - minor												
Alcester	Rural - nucleated												
Catterick, Thornbrough Farm	Rural - nucleated								Y				Y
Coygan Camp	Rural - nucleated												
Dragonby	Rural - nucleated												
Southwark, Babe Ruth Bathouse	Rural - nucleated						Y	Y	Y		Y		
Southwark, Fennings Wharf	Rural - nucleated		Y		Y	Y	Y	Y					
Southwark, Kings College	Rural - nucleated										Y		
Southwark, Lefevre Road	Rural - nucleated							Y					
Southwark, Parnell Road	Rural - nucleated							Y					
Southwark, Tobacco Dock	Rural - nucleated							Y					
Worcester, Deansway	Rural - nucleated												
Worcester, Sidbury	Rural - nucleated												
Caerwent	Urban												
Chichester, Chapel Street	Urban		Y										
Colchester, Culver Street	Urban				Y								
Dorchester, County hall	Urban					Y		Y			Y		Y
Dorchester, Greyhound Yard	Urban							Y	Y	Y	Y		Y
Exeter	Urban			Y	Y								
Ilchester, Great Yard	Urban							Y					
Lincoln	Urban							Y			Y		
London, Peninsula House	Urban		Y				Y			Y			
Silchester, forum-basilica	Urban								Y				
Silchester, insula IX	Urban							Y					
Wroxeter, baths basilica	Urban					Y			Y	Y			
Carr Naze	Military	Y											
Portchester	Military												
Henley Wood	Religious												
St Albans, Folly Lane	Religious												
Uley Shrines	Religious						Y	Y		Y	Y		
	%Representation	13	3	8	3	8	13	16	29	13	13	18	0

Appendix A.IXiii; Presence of fish species with %occurence on all sites which included fish remains (Halibut – Carp)

Site name	Site group	Fish taxa											
Middle Iron Age (n=5)		**Halibut**	**Catfish**	**Pouting**	**Loach**	**Sandlance**	**Ruffe**	**Chub**	**Bullhead**	**Bitterling**	**Turbot**	**Ray**	**Carp**
Gravelly Guy	Rural - minor												
Conderton Camp	Rural - nucleated												
Danebury	Rural - nucleated												
Maiden Castle	Rural - nucleated												
Winklebury Camp	Rural - nucleated												
	%Representation	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Late Iron Age (n=12)													
Balksbury Camp	Rural - minor												
Bishopstone	Rural - minor												
Fishbourne, east (1995-2002)	Rural - minor												
Haddenham V	Rural - minor												
Owslebury	Rural - minor												
Wardy Hill	Rural - minor												
Watkins Farm	Rural - minor												
Wavendon Gate	Rural - minor												
Dragonby	Rural - nucleated												
Silchester	Rural - nucleated												
Sutton Walls	Rural - nucleated												
Haddenham IV	Religious												
	%Representation	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
IA/RB transition (n=10)													
Gravelly Guy	Rural - minor												
Thetford	Rural - minor												
Wavendon Gate	Rural - minor												
Yarford	Rural - minor												
Braughing	Rural - nucleated												
Ditches	Rural - nucleated												
Southwark, Southwark Cathedral	Rural - nucleated												

Site name	Site group	Fish taxa											
IA/RB transition (n=10) continued		Halibut	Catfish	Pouting	Loach	Sandlance	Ruffe	Chub	Bullhead	Bitterling	Turbot	Ray	Carp
Dorchester, Greyhound Yard	Urban												
London, Fleet Valley	Urban												
London, Leadenhall Court	Urban												
	%Representation	0	0	0	0	0	0	0	0	0	0	0	0
Early Roman (n=49)													
Bishopstone	Rural - minor												
Castle Copse	Rural - minor												
Claydon Pike, Longdole's Field	Rural - minor												
Dickson's Corner	Rural - minor												
Fishbourne, east (1995-2002)	Rural - minor			Y									
Gorhambury	Rural - minor							Y					
Meppershall	Rural - minor												
Mount Roman villa	Rural - minor												
Parnwell	Rural - minor												
Scotney Court	Rural - minor	Y											
Winnall Down	Rural - minor												
Carlisle, The Lanes	Rural - nucleated												
Dragonby	Rural - nucleated												
Godmanchester	Rural - nucleated												
Skeleton Green	Rural - nucleated							Y					
Southwark, 1-7 St Thomas Sreet	Rural - nucleated							Y					
Southwark, 199 Borough High	Rural - nucleated												
Southwark, Calverts buildings	Rural - nucleated												
Southwark, Long Lane	Rural - nucleated												
Southwark, Swan Street	Rural - nucleated												
Worcester, Deansway	Rural - nucleated												
Worcester, Sidbury	Rural - nucleated												
Colchester, Balkerne Heights	Urban												
Colchester, former post office	Urban												
Colchester, Gilberd School	Urban												
Dorchester, County hall	Urban												

Site name	Site group	Fish taxa											
Early Roman (n=49) continued		**Halibut**	**Catfish**	**Pouting**	**Loach**	**Sandlance**	**Ruffe**	**Chub**	**Bullhead**	**Bitterling**	**Turbot**	**Ray**	**Carp**
Dorchester, Greyhound Yard	Urban												
Exeter	Urban												
London, 2-5 Devonshire Square	Urban												
London, Billingsgate buildings	Urban												
London, Billingsgate fish market	Urban												
London, Rangoon Street	Urban							Y					
Silchester, forum-basilica	Urban												
York, Fishergate	Urban												
York, General Accident site	Urban												
York, St Mary Bishophill Junior	Urban												
Birdoswald	Military												
Caerleon, scamnum tribunorum	Military												
Carlisle, Castle Street	Military												
Chester, Dee House	Military												
Droitwich, Dodderhill	Military												
Exeter	Military												
Loughor	Military												
Ribchester	Military												
Wallsend	Military												
Haddenham III, Snow's Farm	Religious												
Slonk Hill	Religious												
St Albans, Folly Lane	Religious												
Uley Shrines	Religious												
	%Representation	**2**	**0**	**2**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**
Late Roman (n=38)													
Beddington, well	Rural - minor											Y	
Bignor	Rural - minor												
Castle Copse	Rural - minor												
Gorhambury	Rural - minor												
Great Holts Farm	Rural - minor												
Orton Hall Farm	Rural - minor												

Site name	Site group	Fish taxa											
Late Roman (n=38) continued		Halibut	Catfish	Pouting	Loach	Sandlance	Ruffe	Chub	Bullhead	Bitterling	Turbot	Ray	Carp
Owslebury	Rural - minor												
Shadwell	Rural - minor												
Yarford	Rural - minor												
Alcester	Rural - nucleated												
Catterick, Thornbrough Farm	Rural - nucleated		Y										
Coygan Camp	Rural - nucleated												
Dragonby	Rural - nucleated		Y										
Southwark, Babe Ruth Bathouse	Rural - nucleated												Y
Southwark, Fennings Wharf	Rural - nucleated											Y	
Southwark, Kings College	Rural - nucleated												
Southwark, Lefevre Road	Rural - nucleated												
Southwark, Parnell Road	Rural - nucleated												
Southwark, Tobacco Dock	Rural - nucleated												
Worcester, Deansway	Rural - nucleated												
Worcester, Sidbury	Rural - nucleated												
Caerwent	Urban												
Chichester, Chapel Street	Urban												
Colchester, Culver Street	Urban												
Dorchester, County hall	Urban												
Dorchester, Greyhound Yard	Urban												
Exeter	Urban												
Ilchester, Great Yard	Urban												
Lincoln	Urban				Y	Y	Y	Y	Y	Y			
London, Peninsula House	Urban												
Silchester, forum-basilica	Urban												
Silchester, insula IX	Urban												
Wroxeter, baths basilica	Urban						Y	Y					
Carr Naze	Military										Y	Y	
Portchester	Military												
Henley Wood	Religious												
St Albans, Folly Lane	Religious												
Uley Shrines	Religious												
	%Representation	8	0	5	0	3	3	5	5	3	3	3	8

Appendix A.X; Count of sites with fish remains present or absent.

Phase	Fish present	Rural - minor	Rural - nucleated	Urban	Military	Religious	Grand Total
Middle Iron Age	Yes	1	4				5
	No	25	3				28
Middle Iron Age Total		26	7				33
Late Iron Age	Yes	8	3			1	12
	No	40	5			3	48
Late Iron Age Total		48	8			4	60
IA/RB transition	Yes	4	3	3			10
	No	32	2	3		3	40
IA/RB transition Total		36	5	6		3	50
Early Roman	Yes	11	11	14	9	4	49
	No	43	14	15	10	4	86
Early Roman Total		54	25	29	19	8	135
Late Roman	Yes	9	12	12	2	3	38
	No	45	15	12	6	7	85
Late Roman Total		54	27	24	8	10	123
Grand Total		218	72	59	27	25	401

Appendix B – Meso-scale data

Data in Appendix B refers specifically to the regional analysis (Chapter 5). Whilst many of these are repeated from Appendix A they are included here for ease of access for the reader.

Appendix B.I; Sites in Area 1 with National Grid Reference, county, site type and quantification data (NISP) for cattle, sheep/goat and pig from sites in Area 1

Site name	NGR	County	Site type	Cattle	Sheep/Goat	Pig	Total
Phase One							
Bramdean	SU615285	Hampshire	banjo	277	498	107	882
Brighton Hill	SU626493	Hampshire	enclosed farmstead	134	292	52	478
Bury Hill	SU345435	Hampshire	hillfort	153	317	18	488
Chilbolton Down	SU412374	Hampshire	banjo	113	229	15	357
Danebury	SU324377	Hampshire	hillfort	7068	21283	4230	32581
Houghton Down	SU342361	Hampshire	enclosed farmstead	779	1792	248	2819
Micheldever Wood	SU527370	Hampshire	banjo	836	1147	326	2309
Old Down Farm	SU344465	Hampshire	enclosed farmstead	401	1046	85	1532
Owslebury	SU525246	Hampshire	enclosed farmstead	646	674	186	1506
Rooksdown	SU613541	Hampshire	banjo	324	653	259	1236
Suddern Farm	SU285374	Hampshire	enclosed farmstead	1267	2961	148	4376
Winklebury Camp	SU612528	Hampshire	hillfort	759	1802	263	2824
Winnall Down	SU496300	Hampshire	enclosed farmstead	838	1307	259	2404
Phase Two							
Abbotstone Down	SU584358	Hampshire	farmstead	326	258	63	647
Balksbury Camp	SU350445	Hampshire	unenclosed settlement	1490	2606	810	4906
Brighton Hill	SU626493	Hampshire	enclosed farmstead	159	338	58	555
Copse Farm	SU894055	West Sussex	enclosed farmstead	241	195	77	513
Danebury	SU324377	Hampshire	hillfort	417	716	88	1221
Easton Lane	SU498318	Hampshire	farmstead	165	118	22	305
Fishbourne, Iron Age ditch	SU839047	West Sussex	villa	24	49	197	270
Grateley South	SU274411	Hampshire	farmstead	202	445	48	695
Hayling Island	SU725030	Hampshire	temple	49	1407	988	2444
Houghton Down	SU342361	Hampshire	enclosed farmstead	391	876	94	1361
Lavant	SU868095	West Sussex	enclosed farmstead	75	55	17	147
Little Somborne	SU381353	Hampshire	farmstead	268	256	45	569
Micheldever Wood	SU527370	Hampshire	banjo	320	356	154	830
Nettlebank Copse	SU341391	Hampshire	banjo	938	1360	489	2787
North Bersted	SU927008	West Sussex	enclosed farmstead	259	203	73	535
Old Down Farm	SU344465	Hampshire	enclosed farmstead	153	223	38	414
Ounces Barn	SU921084	West Sussex	farmstead/industrial	114	27	11	152
Owslebury	SU525246	Hampshire	enclosed farmstead	4119	6032	3094	13245
Rooksdown	SU613541	Hampshire	banjo	112	224	32	368
Rucstalls	SU651515	Hampshire	enclosed farmstead	233	470	48	751
Silchester	SU639624	Hampshire	oppidum	3215	2122	2291	7628
Silchester, defences	SU635621	Hampshire	civitas capital	273	109	32	414
Suddern Farm	SU285374	Hampshire	enclosed farmstead	1002	2000	151	3153
Thruxton	SU298461	Hampshire	enclosed farmstead	53	49	14	116
Twyford Down	SU497273	Hampshire	farmstead	43	203	13	259
Winnall Down	SU496300	Hampshire	enclosed farmstead	69	70	15	154
Phase Three							
Castle Copse	SU281625	Wiltshire	villa	97	77	43	217
Chichester, Cattlemarket	SU865045	West Sussex	civitas capital	2879	1230	506	4615
Chichester, Rowes Garage	SU865048	West Sussex	civitas capital	166	31	17	214
Elstead	SU812190	West Sussex	enclosed farmstead	464	305	38	807

Site name	NGR	County	Site type	Cattle	Sheep/Goat	Pig	Total
Phase Three continued							
Fishbourne	SU839047	West Sussex	villa	1480	1654	2548	5682
Fullerton	SU374400	Hampshire	villa	130	381	64	575
Grateley South	SU274411	Hampshire	villa	258	484	40	782
Hayling Island	SU725030	Hampshire	temple	54	2717	2168	4939
Houghton Down	SU342361	Hampshire	villa	37	56	4	97
Little Somborne	SU381353	Hampshire	farmstead	116	221	20	357
Neatham	SU738412	Hampshire	small town	120	172	21	313
Owslebury	SU525246	Hampshire	enclosed farmstead	515	620	213	1348
Rucstalls	SU651515	Hampshire	enclosed farmstead	258	248	58	564
Runfold	SU878481	Surrey	farmstead	232	82	15	329
Silchester	SU639624	Hampshire	civitas capital	1005	764	652	2421
Silchester, defences	SU635621	Hampshire	civitas capital	201	91	70	362
Thruxton	SU298461	Hampshire	villa	89	97	12	198
Winnall Down	SU496300	Hampshire	enclosed farmstead	831	831	129	1791
Phase Four							
Balksbury Camp	SU350445	Hampshire	unenclosed settlement	299	383	38	720
Batten Hanger	SU818154	West Sussex	villa	461	196	101	758
Bignor	SU987146	West Sussex	villa	267	62	18	347
Castle Copse	SU281625	Wiltshire	villa	164	318	1139	1621
Chichester, Cattlemarket	SU865045	West Sussex	civitas capital	2994	1592	707	5293
Chichester, Lavant Culvert	SU861044	West Sussex	civitas capital	59	29	13	101
Chilgrove 2	SU841136	West Sussex	villa	1739	664	79	2482
Fishbourne	SU839047	West Sussex	villa	360	152	192	704
Fishbourne, Harbour	SU836042	West Sussex	villa	105	61	54	220
Houghton Down	SU342361	Hampshire	villa	103	274	43	420
Little Somborne	SU381353	Hampshire	farmstead	145	102	16	263
Monk Sherborne	SU609564	Hampshire	farmstead	294	243	39	576
Neatham	SU738412	Hampshire	small town	950	318	127	1395
Owslebury	SU525246	Hampshire	enclosed farmstead	2236	3268	902	6406
Portchester	SU624045	Hampshire	fort	10774	3212	2654	16640
Rucstalls	SU651515	Hampshire	enclosed farmstead	112	77	0	189
Silchester, defences	SU635621	Hampshire	civitas capital	164	73	91	328
Silchester, forum-basilica	SU639623	Hampshire	civitas capital	906	1479	805	3190
Silchester, insula IX	SU639624	Hampshire	civitas capital	1510	414	318	2242
Watergate	SU773126	West Sussex	villa	288	92	93	473
Westhampnett	SU885065	West Sussex	*ritual*	99	75	26	200

Appendix B.II; Sites in Area 2 with National Grid Reference, county, site type and quantification data for cattle, sheep/goat and pig from sites in Area 1 (data given as NISP)

Site name	NGR	County	Site type	Cattle	Sheep/Goat	Pig	Total
Phase One							
Appleford	SU529937	Oxfordshire	farmstead	198	99	43	**340**
Ashville Trading Estate	SU481973	Oxfordshire	farmstead	366	727	112	**1205**
Aston Mill Farm	SO952354	Worcestershire	farmstead	279	276	74	**629**
Claydon Pike, Warrens Field	SU190996	Gloucestershire	enclosed farmstead	330	279	34	**643**
Conderton Camp	SO971383	Worcestershire	hillfort	758	2165	848	**3771**
Gravelly Guy	SP412050	Oxfordshire	farmstead	2910	4260	667	**7837**
Groundwell Farm	SU157889	Wiltshire	enclosed farmstead	556	1882	1292	**3730**
Spratsgate Lane	SU024997	Gloucestershire	farmstead	322	272	56	**650**
Uley Bury	ST787992	Gloucestershire	hillfort	131	181	126	**438**
Phase Two							
Ashville Trading Estate	SU481973	Oxfordshire	farmstead	290	334	86	**710**
Bicester Fields Farm	SP600223	Oxfordshire	enclosed farmstead	361	206	37	**604**
Birdlip	SO925145	Gloucestershire	farmstead	359	180	57	**596**
Claydon Pike, Longdole's Field	SU190996	Gloucestershire	farmstead	965	727	173	**1865**
Ditches	SO996095	Gloucestershire	hillfort	2028	1644	668	**4340**
Frocester	SO785032	Gloucestershire	enclosed farmstead	1415	2311	566	**4292**
Gravelly Guy	SP412050	Oxfordshire	farmstead	1470	1878	362	**3710**
Mingies Ditch	SP391059	Oxfordshire	Enclosed farmstead	521	914	103	**1538**
Neigh Bridge	SU016948	Gloucestershire	enclosed farmstead	261	179	14	**454**
Uley Bury	ST787992	Gloucestershire	hillfort	175	215	44	**434**
Uley Shrines	ST785989	Gloucestershire	temple	746	2261	63	**3070**
Watkins Farm	SP427034	Oxfordshire	enclosed farmstead	405	429	87	**921**
Phase Three							
Alcester, AES 76-7	SP094574	Warwickshire	small town	843	445	70	**1358**
Alchester	SP572203	Oxfordshire	fort	335	453	202	**990**
Asthall	SP288111	Oxfordshire	small town	160	242	67	**469**
Charlton Kings	SO976208	Gloucestershire	enclosed farmstead	232	176	46	**454**
Cirencester (Maltby)	SP025015	Gloucestershire	civitas capital	3001	983	671	**4655**
Claydon Pike, Longdole's Field	SU190996	Gloucestershire	farmstead	1517	1340	226	**3083**
Conderton Camp	SO971383	Gloucestershire	hillfort	389	1105	205	**1699**
Frocester	SO785032	Gloucestershire	enclosed farmstead	2072	2240	672	**4984**
Haymes	SO984265	Gloucestershire	farmstead	307	258	41	**606**
Tewkesbury	SO882311	Gloucestershire	farmstead	222	301	46	**569**
Uffington White Horse	SU299863	Oxfordshire	hillfort	85	183	39	**307**
Uley Shrines	ST785989	Gloucestershire	temple	1336	9749	305	**11390**
Watkins Farm	SP427034	Oxfordshire	enclosed farmstead	278	100	24	**402**
Wilcote	SP371155	Oxfordshire	roadside settlement	146	633	153	**932**
Worcester, Sidbury	SO852545	Worcestershire	small town	382	437	71	**890**

Site name	NGR	County	Site type	Cattle	Sheep/Goat	Pig	Total
Phase Four							
Alcester	SP094574	Warwickshire	small town	6834	2335	1186	**10355**
Asthall	SP288111	Oxfordshire	small town	249	233	51	**533**
Barnsley Park	SP082058	Gloucestershire	villa	3781	6529	1236	**11546**
Cirencester (Maltby)	SP025015	Gloucestershire	civitas capital	7409	2184	1206	**10799**
Claydon Pike, Longdole's Field	SU190996	Gloucestershire	villa	1715	1253	280	**3248**
Droitwich, Bays Meadow	SO903640	Worcestershire	villa	1204	477	264	**1945**
Farmoor	SP452068	Oxfordshire	farmstead	204	106	16	**326**
Frocester	SO785032	Gloucestershire	villa	3508	1822	685	**6015**
Kingscote	ST817964	Gloucestershire	small town	2377	2167	828	**5372**
Lowbury Hill	SU540822	Oxfordshire	religious	124	338	105	**567**
Shakenoak	SP370141	Oxfordshire	villa	1818	855	490	**3163**
Uley Shrines	ST785989	Gloucestershire	temple	1158	26806	459	**28423**
Wilcote	SP371155	Oxfordshire	roadside settlement	1197	2104	291	**3592**
Worcester, Sidbury	SO852545	Worcestershire	small town	1690	874	237	**2801**

Appendix B.III; Number and percentage of cattle mandible specimens by Mandible Wear Stage by site in Area 1 (sample sizes above 100 have been converted to percentages)

Site name	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Phase One																			
Brighton Hill	0	0	0	1	1	0	3	0	0	**5**	0.0	0.0	0.0	20.0	20.0	0.0	60.0	0.0	0.0
Rooksdown	2	3	0	1	2	1	5	2	2	**18**	11.1	16.7	0.0	5.6	11.1	5.6	27.8	11.1	11.1
Suddern Farm	0	0	1	5	0	8	4	1	0	**19**	0.0	0.0	5.3	26.3	0.0	42.1	21.1	5.3	0.0
Winnall Down	5	0	5	3	3	8	7	3	2	**36**	13.9	0.0	13.9	8.3	8.3	22.2	19.4	8.3	5.6
Danebury	17	12	18	42	7	1	2	0	1	**100**	17.0	12.0	18.0	42.0	7.0	1.0	2.0	0.0	1.0
Phase Two																			
Brighton Hill	0	0	3	7	3	20	0	0	0	**33**	0.0	0.0	9.1	21.2	9.1	60.6	0.0	0.0	0.0
Suddern Farm	1	2	1	2	1	1	4	0	0	**12**	8.3	16.7	8.3	16.7	8.3	8.3	33.3	0.0	0.0
Copse Farm	0	0	0	3	1	1	1	4	2	**12**	0.0	0.0	0.0	25.0	8.3	8.3	8.3	33.3	16.7
Silchester	0	0	0	3	12	4	10	4	3	**36**	0.0	0.0	0.0	8.3	33.3	11.1	27.8	11.1	8.3
Owslebury	4	6	1	6	11	3	5	10	54	**100**	4.0	6.0	1.0	6.0	11.0	3.0	5.0	10.0	54.0
Balksbury Camp	2	1	4	7	1	8	18	9	10	**60**	3.3	1.7	6.7	11.7	1.7	13.3	30.0	15.0	16.7
Phase Three																			
Copse Farm	0	0	0	1	4	5	2	3	1	**16**	0.0	0.0	0.0	6.3	25.0	31.3	12.5	18.8	6.3
Fishbourne	0	2	6	3	1	0	2	0	1	**15**	0.0	13.3	40.0	20.0	6.7	0.0	13.3	0.0	6.7
Silchester, forum-basilica	2	0	1	4	1	4	4	2	4	**22**	9.1	0.0	4.5	18.2	4.5	18.2	18.2	9.1	18.2
Owslebury	0	1	1	5	5	0	2	3	19	**36**	0.0	2.8	2.8	13.9	13.9	0.0	5.6	8.3	52.8
Chichester, Cattlemarket	0	0	6	6	0	3	14	9	11	**49**	0.0	0.0	12.2	12.2	0.0	6.1	28.6	18.4	22.4
Phase Four																			
Westhampnett	0	0	0	0	3	1	3	0	0	**7**	0.0	0.0	0.0	0.0	42.9	14.3	42.9	0.0	0.0
Monk Sherborne	2	1	1	0	1	3	7	1	0	**16**	12.5	6.3	6.3	0.0	6.3	18.8	43.8	6.3	0.0
Watergate	0	2	2	4	6	1	3	5	5	**28**	0.0	7.1	7.1	14.3	21.4	3.6	10.7	17.9	17.9
Silchester, insula IX	1	1	0	3	16	14	11	0	0	**46**	2.2	2.2	0.0	6.5	34.8	30.4	23.9	0.0	0.0
Batten Hanger	0	0	2	7	4	5	14	4	12	**48**	0.0	0.0	4.2	14.6	8.3	10.4	29.2	8.3	25.0
Chichester, Cattlemarket	0	1	0	5	6	10	10	12	6	**50**	0.0	2.0	0.0	10.0	12.0	20.0	20.0	24.0	12.0
Owslebury	0	6	1	1	6	2	5	9	51	**81**	0.0	7.4	1.2	1.2	7.4	2.5	6.2	11.1	63.0

Appendix B.IV; Number and percentage of cattle mandible specimens by Mandible Wear Stage by site in Area 2

Site name	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Phase One																			
Aston Mill Farm	0	0	0	2	2	0	1	0	0	**5**	0.0	0.0	0.0	40.0	40.0	0.0	20.0	0.0	0.0
Claydon Pike, Warrens Field	0	0	1	2	1	8	2	3	0	**17**	0.0	0.0	5.9	11.8	5.9	47.1	11.8	17.6	0.0
Spratsgate Lane	0	0	5	1	2	1	5	1	2	**17**	0.0	0.0	29.4	5.9	11.8	5.9	29.4	5.9	11.8
Gravelly Guy	3	3	7	5	1	0	8	0	0	**27**	11.1	11.1	25.9	18.5	3.7	0.0	29.6	0.0	0.0
Conderton Camp	1	8	1	7	5	4	2	10	0	**38**	2.6	21.1	2.6	18.4	13.2	10.5	5.3	26.3	0.0
Phase Two																			
Bicester Fields Farm	0	0	1	4	5	2	1	1	0	**14**	0.0	0.0	7.1	28.6	35.7	14.3	7.1	7.1	0.0
Watkins Farm	0	2	2	0	4	3	0	3	1	**15**	0.0	13.3	13.3	0.0	26.7	20.0	0.0	20.0	6.7
Mingies Ditch	0	2	8	3	2	3	5	0	0	**23**	0.0	8.7	34.8	13.0	8.7	13.0	21.7	0.0	0.0
Claydon Pike, Longdole's Field	0	4	1	3	10	5	5	7	0	**35**	0.0	11.4	2.9	8.6	28.6	14.3	14.3	20.0	0.0
Phase Three																			
Alchester	0	0	0	1	1	0	1	1	2	**6**	0.0	0.0	0.0	16.7	16.7	0.0	16.7	16.7	33.3
Droitwich, Hanbury Street	0	0	0	0	0	2	1	1	3	**7**	0.0	0.0	0.0	0.0	0.0	28.6	14.3	14.3	42.9
Alcester	0	1	0	0	2	2	3	3	0	**11**	0.0	9.1	0.0	0.0	18.2	18.2	27.3	27.3	0.0
Conderton Camp	0	3	0	3	0	0	1	4	0	**11**	0.0	27.3	0.0	27.3	0.0	0.0	9.1	36.4	0.0
Asthall	4	2	0	0	2	5	1	5	0	**19**	21.1	10.5	0.0	0.0	10.5	26.3	5.3	26.3	0.0
Droitwich, Dodderhill	0	0	3	3	0	1	4	4	4	**19**	0.0	0.0	15.8	15.8	0.0	5.3	21.1	21.1	21.1
Claydon Pike, Longdole's Field	0	3	2	6	11	11	9	14	1	**57**	0.0	5.3	3.5	10.5	19.3	19.3	15.8	24.6	1.8
Phase Four																			
Droitwich, Hanbury Street	0	0	0	0	0	0	0	2	1	**3**	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	33.3
Claydon Pike, Longdole's Field	0	6	0	4	5	8	15	12	1	**51**	0.0	11.8	0.0	7.8	9.8	15.7	29.4	23.5	2.0
Cirencester (Maltby)	0	0	0	6	0	12	16	16	16	**66**	0.0	0.0	0.0	9.1	0.0	18.2	24.2	24.2	24.2

Appendix B.V; Number and percentage of sheep/goat mandible specimens by Mandible Wear Stage by site in Area 1 (sample sizes above 100 have been converted to percentages)

Site name	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Phase One																			
Brighton Hill	0	0	4	2	8	3	0	0	0	**17**	0.0	0.0	23.5	11.8	47.1	17.6	0.0	0.0	0.0
Danebury	6	12	27	12	12	14	15	2	0	**100**	6.0	12.0	27.0	12.0	12.0	14.0	15.0	2.0	0.0
Houghton Down (Hamilton)	5	9	11	3	19	8	1	1	0	**57**	8.8	15.8	19.3	5.3	33.3	14.0	1.8	1.8	0.0
Old Down Farm	2	11	19	2	1	10	7	2	1	**55**	3.6	20.0	34.5	3.6	1.8	18.2	12.7	3.6	1.8
Owslebury	0	22	18	9	6	14	6	9	0	**84**	0.0	26.2	21.4	10.7	7.1	16.7	7.1	10.7	0.0
Rooksdown	0	0	15	13	6	8	9	0	0	**51**	0.0	0.0	29.4	25.5	11.8	15.7	17.6	0.0	0.0
Suddern Farm	3	4	9	7	1	11	7	4	0	**46**	6.5	8.7	19.6	15.2	2.2	23.9	15.2	8.7	0.0
Winnall Down	3	14	39	6	7	7	15	6	0	**97**	3.1	14.4	40.2	6.2	7.2	7.2	15.5	6.2	0.0
Phase Two																			
Abbotstone Down	0	0	3	9	9	5	4	0	0	**30**	0.0	0.0	10.0	30.0	30.0	16.7	13.3	0.0	0.0
Balksbury Camp	6	15	34	9	7	16	7	4	2	**100**	6.0	15.0	34.0	9.0	7.0	16.0	7.0	4.0	2.0
Brighton Hill	2	6	13	17	7	10	3	0	0	**58**	3.4	10.3	22.4	29.3	12.1	17.2	5.2	0.0	0.0
Copse Farm	0	3	3	2	0	4	0	0	1	**13**	0.0	23.1	23.1	15.4	0.0	30.8	0.0	0.0	7.7
Danebury	0	4	5	7	5	8	4	0	0	**33**	0.0	12.1	15.2	21.2	15.2	24.2	12.1	0.0	0.0
Houghton Down (Hamilton)	1	0	1	4	4	1	7	0	0	**18**	5.6	0.0	5.6	22.2	22.2	5.6	38.9	0.0	0.0
Lavant	0	1	1	1	0	2	0	2	0	**7**	0.0	14.3	14.3	14.3	0.0	28.6	0.0	28.6	0.0
Micheldever Wood	1	3	16	15	8	10	12	2	0	**67**	1.5	4.5	23.9	22.4	11.9	14.9	17.9	3.0	0.0
Nettlebank Copse	1	3	9	13	13	9	9	0	1	**58**	1.7	5.2	15.5	22.4	22.4	15.5	15.5	0.0	1.7
North Bersted	0	0	1	0	7	0	1	0	0	**9**	0.0	0.0	11.1	0.0	77.8	0.0	11.1	0.0	0.0
Owslebury	0	6	14	25	12	19	15	8	0	**99**	0.0	6.1	14.1	25.3	12.1	19.2	15.2	8.1	0.0
Rooksdown	0	1	6	4	2	5	4	1	3	**26**	0.0	3.8	23.1	15.4	7.7	19.2	15.4	3.8	11.5
Silchester	3	10	7	17	8	15	8	0	0	**68**	4.4	14.7	10.3	25.0	11.8	22.1	11.8	0.0	0.0
Suddern Farm	5	3	5	18	12	19	15	12	0	**89**	5.6	3.4	5.6	20.2	13.5	21.3	16.9	13.5	0.0
Phase Three																			
Chichester, Cattlemarket	0	4	16	15	21	13	18	7	6	**100**	0.0	4.0	16.0	15.0	21.0	13.0	18.0	7.0	6.0
Copse Farm	0	0	1	4	2	1	0	0	0	**8**	0.0	0.0	12.5	50.0	25.0	12.5	0.0	0.0	0.0
Fishbourne	2	6	13	15	25	18	12	3	6	**100**	2.0	6.0	13.0	15.0	25.0	18.0	12.0	3.0	6.0
Owslebury	0	5	14	21	9	19	11	10	0	**89**	0.0	5.6	15.7	23.6	10.1	21.3	12.4	11.2	0.0
Silchester, forum-basilica	3	5	0	10	7	4	2	1	0	**32**	9.4	15.6	0.0	31.3	21.9	12.5	6.3	3.1	0.0
Winnall Down	1	3	15	6	15	9	13	2	0	**64**	1.6	4.7	23.4	9.4	23.4	14.1	20.3	3.1	0.0
Phase Four																			
Batten Hanger	0	4	0	4	9	10	2	0	0	**29**	0.0	13.8	0.0	13.8	31.0	34.5	6.9	0.0	0.0
Chichester, Cattlemarket	0	4	7	16	22	27	13	8	1	**98**	0.0	4.1	7.1	16.3	22.4	27.6	13.3	8.2	1.0
Fishbourne, Harbour	0	0	0	1	1	2	1	1	0	**6**	0.0	0.0	0.0	16.7	16.7	33.3	16.7	16.7	0.0
Monk Sherborne	0	1	2	4	0	0	3	5	0	**15**	0.0	6.7	13.3	26.7	0.0	0.0	20.0	33.3	0.0
Owslebury	0	7	14	18	5	23	22	11	0	**100**	0.0	7.0	14.0	18.0	5.0	23.0	22.0	11.0	0.0
Silchester, forum-basilica	0	12	1	14	12	10	12	0	0	**61**	0.0	19.7	1.6	23.0	19.7	16.4	19.7	0.0	0.0
Silchester, insula IX	1	1	1	2	9	10	4	1	0	**29**	3.4	3.4	3.4	6.9	31.0	34.5	13.8	3.4	0.0
Watergate	0	2	3	2	1	2	1	0	0	**11**	0.0	18.2	27.3	18.2	9.1	18.2	9.1	0.0	0.0
Westhampnett	0	0	0	1	3	4	1	0	0	**9**	0.0	0.0	0.0	11.1	33.3	44.4	11.1	0.0	0.0

Appendix B.VI; Number and percentage of sheep/goat mandible specimens by Mandible Wear Stage by site in Area 2 (sample sizes above 100 have been converted to percentages)

Site name	A	B	C	D	E	F	G	H	J	Total	A%	B%	C%	D%	E%	F%	G%	H%	J%
Phase One																			
Ashville Trading Estate	0	3	9	10	7	3	16	3	0	**51**	0.0	5.9	17.6	19.6	13.7	5.9	31.4	5.9	0.0
Aston Mill Farm	0	3	7	4	0	3	4	0	1	**22**	0.0	13.6	31.8	18.2	0.0	13.6	18.2	0.0	4.5
Claydon Pike, Warrens Field	0	1	8	0	9	10	3	0	0	**31**	0.0	3.2	25.8	0.0	29.0	32.3	9.7	0.0	0.0
Conderton Camp	0	17	0	15	9	0	11	0	0	**52**	0.0	32.7	0.0	28.8	17.3	0.0	21.2	0.0	0.0
Gravelly Guy	5	9	25	17	10	8	22	3	1	**100**	5.0	9.0	25.0	17.0	10.0	8.0	22.0	3.0	1.0
Spratsgate Lane	0	0	1	0	8	3	2	7	0	**21**	0.0	0.0	4.8	0.0	38.1	14.3	9.5	33.3	0.0
Phase Two																			
Ashville Trading Estate	0	0	6	6	2	0	4	1	0	**19**	0.0	0.0	31.6	31.6	10.5	0.0	21.1	5.3	0.0
Barton Court Farm	1	2	11	6	6	4	8	0	0	**38**	2.6	5.3	28.9	15.8	15.8	10.5	21.1	0.0	0.0
Bicester Fields Farm	1	1	1	1	4	3	5	0	0	**16**	6.3	6.3	6.3	6.3	25.0	18.8	31.3	0.0	0.0
Mingies Ditch	0	6	15	3	7	4	3	0	0	**38**	0.0	15.8	39.5	7.9	18.4	10.5	7.9	0.0	0.0
Watkins Farm	0	2	13	1	5	8	13	1	0	**43**	0.0	4.7	30.2	2.3	11.6	18.6	30.2	2.3	0.0
Claydon Pike, Longdole's Field	0	2	3	14	15	8	13	0	0	**55**	0.0	3.6	5.5	25.5	27.3	14.5	23.6	0.0	0.0
Ditches	2	1	4	37	18	15	8	0	0	**85**	2.4	1.2	4.7	43.5	21.2	17.6	9.4	0.0	0.0
Phase Three																			
Alcester	1	2	7	6	4	5	0	10	0	**35**	2.9	5.7	20.0	17.1	11.4	14.3	0.0	28.6	0.0
Alchester	0	0	2	4	2	1	0	2	0	**11**	0.0	0.0	18.2	36.4	18.2	9.1	0.0	18.2	0.0
Asthall	0	0	11	16	12	10	7	0	0	**56**	0.0	0.0	19.6	28.6	21.4	17.9	12.5	0.0	0.0
Barton Court Farm	0	1	6	30	28	12	17	3	2	**99**	0.0	1.0	6.1	30.3	28.3	12.1	17.2	3.0	2.0
Claydon Pike, Longdole's Field	0	4	8	12	16	30	28	1	1	**100**	0.0	4.0	8.0	12.0	16.0	30.0	28.0	1.0	1.0
Conderton Camp	0	18	1	14	1	6	12	0	0	**52**	0.0	34.6	1.9	26.9	1.9	11.5	23.1	0.0	0.0
Droitwich, Hanbury Street	0	0	1	3	1	0	0	0	0	**5**	0.0	0.0	20.0	60.0	20.0	0.0	0.0	0.0	0.0
Uffington White Horse	0	1	2	2	0	0	0	0	0	**5**	0.0	20.0	40.0	40.0	0.0	0.0	0.0	0.0	0.0
Phase Four																			
Claydon Pike, Longdole's Field	0	2	3	9	26	13	19	0	0	**72**	0.0	2.8	4.2	12.5	36.1	18.1	26.4	0.0	0.0

Appendix B.VII; Number and percentage of pig mandible specimens by Mandible Wear Stage by site in Area 1

Site name	A	B	C	D	E	F	Total	A%	B%	C%	D%	E%	F%
Phase One													
Brighton Hill	0	0	3	0	2	1	**6**	0.0	0.0	50.0	0.0	33.3	16.7
Danebury	8	19	3	16	38	0	**84**	9.5	22.6	3.6	19.0	45.2	0.0
Suddern Farm	0	1	0	6	0	0	**7**	0.0	14.3	0.0	85.7	0.0	0.0
Phase Two													
Brighton Hill	1	4	2	3	8	3	**21**	6.7	26.7	6.7	20.0	20.0	20.0
Copse Farm	0	1	0	1	3	0	**5**	0.0	20.0	0.0	20.0	60.0	0.0
Balksbury Camp	0	12	6	8	6	0	**32**	0.0	37.5	18.8	25.0	18.8	0.0
Fishbourne	0	2	4	10	1	0	**17**	0.0	11.8	23.5	58.8	5.9	0.0
Owslebury	2	1	8	2	7	4	**24**	8.3	4.2	33.3	8.3	29.2	16.7
Silchester	2	0	9	49	0	0	**60**	3.3	0.0	15.0	81.7	0.0	0.0
Phase Three													
Chichester, Cattlemarket	1	4	22	28	15	2	**72**	1.4	5.6	30.6	38.9	20.8	2.8
Copse Farm	0	0	0	4	3	0	**7**	0.0	0.0	0.0	57.1	42.9	0.0
Fishbourne	5	6	8	26	13	2	**60**	8.3	10.0	13.3	43.3	21.7	3.3
Owslebury	0	2	4	22	13	1	**42**	0.0	4.8	9.5	52.4	31.0	2.4
Silchester	0	4	3	14	0	0	**21**	0.0	19.0	14.3	66.7	0.0	0.0
Phase Four													
Batten Hanger	1	5	2	5	5	0	**18**	5.6	27.8	11.1	27.8	27.8	0.0
Chichester, Cattlemarket	0	0	0	2	0	1	**3**	0.0	0.0	0.0	66.7	0.0	33.3
Fishbourne, Harbour	0	0	2	1	0	0	**3**	0.0	0.0	66.7	33.3	0.0	0.0
Monk Sherborne	0	0	3	1	0	0	**4**	0.0	0.0	75.0	25.0	0.0	0.0
Owslebury	0	0	0	3	1	2	**6**	0.0	0.0	0.0	50.0	16.7	33.3
Silchester	7	8	3	13	3	0	**34**	20.6	23.5	8.8	38.2	8.8	0.0
Watergate	1	2	1	5	1	0	**10**	10.0	20.0	10.0	50.0	10.0	0.0
Westhampnett	0	1	0	2	0	0	**3**	0.0	33.3	0.0	66.7	0.0	0.0

Appendix B.VIII; Number and percentage of pig mandible specimens by Mandible Wear Stage by site in Area 2

Site name	A	B	C	D	E	F	Total	A%	B%	C%	D%	E%	F%
Phase One													
Aston Mill Farm	0	0	0	6	1	0	**7**	0.0	0.0	0.0	85.7	14.3	0.0
Conderton Camp	2	9	26	4	0	2	**43**	4.7	20.9	60.5	9.3	0.0	4.7
Gravelly Guy	0	6	7	19	5	0	**37**	0.0	16.2	18.9	51.4	13.5	0.0
Spratsgate Lane	0	0	1	1	2	0	**4**	0.0	0.0	25.0	25.0	50.0	0.0
Phase Two													
Claydon Pike, Longdole's Field	1	3	3	6	6	0	**19**	5.3	15.8	15.8	31.6	31.6	0.0
Bicester Fields Farm	0	0	1	3	0	0	**4**	0.0	0.0	25.0	75.0	0.0	0.0
Phase Three													
Alcester	0	0	3	3	0	0	**6**	0.0	0.0	50.0	50.0	0.0	0.0
Alchester	0	1	1	3	1	0	**6**	0.0	16.7	16.7	50.0	16.7	0.0
Claydon Pike, Longdole's Field	0	2	0	3	5	1	**11**	0.0	18.2	0.0	27.3	45.5	9.1
Droitwich, Hanbury Street	0	0	2	1	1	0	**4**	0.0	0.0	50.0	25.0	25.0	0.0
Phase Four													
Claydon Pike, Longdole's Field	0	1	9	4	4	0	**18**	0.0	5.6	50.0	22.2	22.2	0.0

Appendix C – Micro-scale data

Appendix C.I; NISP taxa from late Iron Age sites

Site name	Site type	Cattle	Sheep/Goat	Pig	Horse	Dog	Red deer	Crow/Rook
Copse Farm	Farmstead	241	195	77	114	19		2
North Bersted	Farmstead	259	203	73	19	10	1	

Appendix C.II; NISP taxa from IA/RB transition sites

Site name	Site type	Cattle	Sheep/Goat	Pig	Horse	Dog	Red deer	Roe deer	Hare	Mallard	Raven
Carne's Seat	Enclosure	85	117	32	12	2			17	1	
Copse Farm	Farmstead	538	205	80	259	39	1				1
Hayling Island	Temple	49	1407	988	46	1	4	7			
Lavant	Farmstead	75	55	17	3	1	3	1			
Ounces Barn	Industrial	114	27	11	9						

Appendix C.III; NISP taxa from early Roman sites

Site name	Site type	Cattle	Sheep/ Goat	Pig	Horse	Dog	Cat	Red deer	Roe deer	Hare	Fox	Bird	Dom. fowl	Mallard	Goose	Crow/ Rook	Jackdaw	Raven
Chichester, Cattlemarket	Urban	2879	1230	506	66	51	1	2	3	2		3	42	9	3	5	4	5
Chichester, Rowes Garage	Urban	166	31	17	7	5					1							
Elstead	Farmstead	464	305	38	26	17		3										
Hayling Island	Temple	54	2717	2168	8	1		2										

Appendix C.IV; NISP taxa from late Roman sites

Site name	Site Type	Cattle	Sheep/ Goat	Pig	Horse	Dog	Cat	Red deer	Roe deer	Fallow deer	Hare	Bird	Dom. fowl	Mallard	Goose	Woodcock	Crow/ Rook	Jackdaw	Raven	Eel
Batten Hanger	Villa	461	196	101	69	17	1	31	6											
Bignor	Villa	267	62	18	6	4		3					4							1
Chichester, Cattlemarket	Urban	2994	1592	707	111	436		18	6		8	12	90	9	7	4	5	5	2	
Chichester, Lavant Culvert	Urban	59	29	13	12	18			1	1										
Chilgrove 2	Villa	1739	664	79	286	366	25	11												
Watergate Hanger	Villa	288	92	93	19	4	1	32	16											
Westhampnett	Rural	99	75	26	25	6					1	1	5							

Appendix C.V; Count of aged cattle specimens from 'micro-scale' sites by phase

Site	Date/Phase	Mandible Wear Stage									Total
		A/B	B	C	D	E	F	G	H	J	
Fishbourne	1stC.BC-AD			1	1	1	1	1	2	1	**8**
	1st-2ndC.AD	1	1	4	3	1	1		1		**12**
	2nd-3rdC.AD			1			3	2	1		**7**
	3rd-4thC.AD				1	1	1	1			**4**
Chichester Cattlemarket	1stC.AD			4	3		1	5	3	3	**19**
	1st-2ndC.AD		1		4	6	9	9	10	5	**44**
	2nd-3rdC.AD			2	4		2	9	6	4	**27**
	4thC.AD						1	1	2	1	**5**
Carne's Seat	Iron Age						1	1			**2**
	Roman			1	1				1		**3**
Oving	late Iron Age				3	1	1	1	4	2	**12**
	early Roman				1	4	5	2	3	1	**16**
	Total	**1**	**2**	**13**	**21**	**14**	**26**	**32**	**33**	**17**	**159**

Appendix C.VI; Count of aged sheep/goat specimens from 'micro-scale' sites by phase

Site	Date/Phase	Mandible Wear Stage									Total
		A	B	C	D	E	F	G	H	J	
Fishbourne	1stC.BC-AD			5	4	3	5	6	1	1	**25**
	1st-2ndC.AD	2	1	2	8	17	11	5	2	4	**52**
	2nd-3rdC.AD		1	1	3	6	3	4			**18**
	3rd-4thC.AD				4	4	3	2	1		**14**
Chichester Cattlemarket	1stC.AD		1	9	11	10	10	8	3	1	**53**
	1st-2ndC.AD		4	5	15	17	21	11	8	1	**82**
	2nd-3rdC.AD		3	8	5	12	6	10	4	5	**53**
	4thC.AD			1		4	1	2			**8**
Batten Hanger	late Roman			1		3		1			**5**
Carne's Seat	Iron Age		2			1		2	1		**6**
	Roman			1	1	3	2	1	1	1	**10**
Elstead	early Roman			1	2	5	2	2	3	2	**17**
Lavant	early Roman		1	1	1		2		2		**7**
North Bersted	late Iron Age			1		7		1			**9**
Oving	late Iron Age		3	3	2		4			1	**13**
	early Roman			1	4	2	1				**8**
	Total	**2**	**16**	**40**	**60**	**94**	**71**	**55**	**26**	**16**	**380**

Appendix C.VII; Count of aged pig specimens from 'micro-scale' sites by phase

Site	Date/Phase	Mandible Wear Stage								Total
		A	B	C	D	E	F	G	H	
Fishbourne	1stC.BC-AD	3	3	6	20	10	3			**45**
	1st-2ndC.AD	6	4	11	25	14	2			**62**
	2nd-3rdC.AD		1	7	6	3				**17**
	3rd-4thC.AD	2	1		3	3			1	**10**
Chichester Cattkemarket	1stC.AD	1		5	5	5	1			**17**
	1st-2ndC.AD		3	9	9	5		1		**27**
	2nd-3rdC.AD		1	8	14	5	1			**29**
	4thC.AD				2					**2**
Carne's Seat	Iron Age				2					**2**
Lavant	LIA/ERB				1	1				**2**
Oving	late Iron Age		1		1	3				**5**
	early Roman				4	3				**7**
	Total	**12**	**14**	**46**	**92**	**52**	**7**	**1**	**1**	**225**

Appendix C.VIII; Count of cattle/cow-sized specimens with cut marks by type, placement and by phase from Fishbourne

Cattle/cow-size	Body Part	cut/shave	chop/saw	fracture
Phase 1 n=155	shoulder & neck	8	9	1
	torso	19	13	0
	rump	6	19	0
	forelimbs	4	10	8
	rearlimbs	0	5	7
	hock joints & feet	6	21	19
Phase 2 n=328	shoulder & neck	8	37	0
	torso	35	16	0
	rump	5	30	0
	forelimbs	5	23	9
	rearlimbs	4	7	13
	hock joints & feet	27	38	71
Phase 3 n=86	shoulder & neck	4	18	0
	torso	14	3	0
	rump	3	4	0
	forelimbs	3	5	5
	rearlimbs	0	3	2
	hock joints & feet	5	8	9
Phase 4 n=115	shoulder & neck	8	25	0
	torso	9	7	0
	rump	3	10	0
	forelimbs	5	7	0
	rearlimbs	1	2	5
	hock joints & feet	7	11	15

Appendix C.IX; Count of sheep/goat specimens with cut marks by type, placement and by phase from Fishbourne

Sheep/Goat	Body Part	cut/shave	chop/saw	fracture
Phase 1 n=58	shoulder & neck	4	3	0
	rump	3	4	0
	forelimbs	5	9	0
	rearlimbs	2	6	3
	hock joints & feet	6	8	5
Phase 2 n=74	shoulder & neck	7	7	0
	rump	4	10	0
	forelimbs	8	8	3
	rearlimbs	6	9	2
	hock joints & feet	5	4	1
Phase 3 n=20	shoulder & neck	0	5	0
	rump	2	1	0
	forelimbs	3	1	0
	rearlimbs	0	1	0
	hock joints & feet	5	2	0
Phase 4 n=20	shoulder & neck	2	1	0
	rump	0	2	0
	forelimbs	4	1	0
	rearlimbs	2	1	1
	hock joints & feet	3	3	0

Appendix C.X; Count of pig specimens with cut marks by type, placement and by phase from Fishbourne

Pig	Body Part	cut/shave	chop/saw	fracture
Phase 1 n=93	shoulder & neck	10	6	1
	rump	4	6	0
	forelimbs	12	20	6
	rearlimbs	2	9	5
	hock joints & feet	4	8	0
Phase 2 n=170	shoulder & neck	10	10	1
	rump	6	20	
	forelimbs	14	33	1
	rearlimbs	14	25	12
	hock joints & feet	10	14	
Phase 3 n=16	shoulder & neck	6	0	0
	rump	1	2	0
	forelimbs	2	2	0
	rearlimbs	0	1	0
	hock joints & feet	1	1	0
Phase 4 n=45	shoulder & neck	4	1	0
	rump	1	5	0
	forelimbs	10	5	2
	rearlimbs	1	7	4
	hock joints & feet	2	3	0

Appendix D - Radiography data

Appendix D.I Dental development conversion charts for sheep/goat premolars. Numbers in the chart relate to the premolars as follows:

P4 -	- P3 -	- P2
(dp4 -)	(- dp3 -)	(- dp2)

sheep	Premolar tooth development scores																	
Age (months)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	1	2	3	4	5	6	7	8	9	10
56+																		3-3-3
55																	1-2-0	2-2-0
54																		1-1-0
53																		2-1-0
52																		1-1-0
51																		
50																		
49																		
48																	1-0-0	0-1-1
47																		
46																		
45																	2-1-1	0-2-0
44																		1-0-0
43																	2-2-0	
42																	2-1-0	0-1-0
41																	1-0-0	1-2-0
40																		
39																	2-1-0	0-1-0
38																		
37																		
36																	1-1-0	
35																	3-3-0	
34																		
33																		
32																1-0-0	2-2-1	
31																1-1-0	6-6-5	1-1-0
30																	2-2-1	
29																		
28												infundibulum unobservable in radiograph				2-2-1		
27																1-0-0		
26																1-0-0		
25													0-1-0			1-0-0	0-1-0	
24													1-1-1	1-1-1				
23													1-1-3	3-3-1				
22															1-1-1			
21																		
20								(1-1-1)		0-0-1	1-1-0		1-1-0					
19														1-1-0				
18							(1-0-0)	(1-1-2)	0-0-1	0-0-1	1-2-2		3-3-1	2-1-0				
17								(0-0-1)	0-0-1	0-0-2	0-1-0		6-5-2	1-1-0				
16																		
15								(2-2-0)	2-2-2									
14																		
13																		
12																		
11							(2-1-1)	(0-1-1)										
10							(2-2-0)	(0-0-2)										
9																		
8							(3-3-2)											
7																		
6							(1-1-1)											
5						(2-0-0)	(0-2-1)	(0-1-0)										
4																		
3																		
2																		
1				(0-0-1)		(1-1-0)												
0			(0-0-1)	(2-2-1)														
in utero	(2-2-1)	(1-0-0)		(0-1-0)														

Appendix D.II; Dental development conversion charts for sheep/goat molars. Numbers in the chart relate to the molars as follows:

M3 -	- M2 -	- M1

Sheep		Molar tooth development scores									
		1	2	3	4	5	6	7	8	9	10
Age (months)	56+										3-3-3
	55									3-1-0	1-3-4
	54									1-0-0	0-1-1
	53									2-1-0	0-1-2
	52									1-0-0	0-1-1
	51										
	50										
	49										
	48									1-0-0	0-1-1
	47										
	46										
	45									3-2-1	0-2-2
	44									1-1-0	0-0-1
	43							1-0-0	1-1-0	0-1-1	0-0-1
	42								2-1-0	0-1-1	0-0-1
	41								1-0-0	1-2-0	0-0-2
	40										
	39								1-0-0	1-1-1	0-1-1
	38										
	37										
	36							1-0-0	0-1-0	0-0-1	
	35							2-0-0	1-1-0	0-2-1	0-0-2
	34										
	33										
	32						1-0-0	1-0-0	1-0-0	0-3-2	0-0-1
	31						2-0-0	5-0-0	0-2-0	1-5-6	0-1-2
	30							2-0-0	0-2-0	0-0-2	
	29										
	28						1-0-0	1-0-0	0-2-0	0-0-2	
	27						1-0-0		0-1-0	0-0-1	
	26						1-0-0	0-1-0		0-0-1	
	25					2-0-0		0-2-0		0-0-2	
	24					1-0-0	1-0-0	0-1-0	0-1-2		
	23					4-0-0	0-1-0	0-3-0	0-0-3	0-0-1	
	22					1-0-0		0-1-0		0-0-1	
	21										
	20				1-0-0	1-0-0		0-2-0	0-0-2		
	19					2-0-0	0-2-0		0-0-2		
	18				3-0-0	2-0-0	0-4-0	0-2-0	0-0-6		
	17			1-0-0	3-0-0	3-0-0	0-5-0	0-2-0	0-0-7		
	16										
	15		2-0-0				0-2-0		0-0-2		
	14										
	13										
	12										
	11	2-0-0				0-2-0		0-0-2			
	10	2-0-0				0-2-0	0-0-1	0-0-1			
	9										
	8	1-0-0			0-2-0	0-1-0	0-0-3				
	7										
	6				0-1-0		0-0-1				
	5			0-2-0			0-0-2				
	4										
	3										
	2										
	1				0-0-1						
	0			0-0-2							
	in utero	0-0-1									

Appendix D.III Dental development conversion charts for pig premolars (after Carter and Magnell 2007). Numbers in the chart relate to the premolars as follows:

pig		Premolar tooth development scores												
Age (months)		(4)	(5)	(6)	(7)	(8)	1	2	3	4	5	6	7	8
Mar	48													2-2-2
Feb	47													
Jan	46													
Dec	45													
Nov	44													
Oct	43													
Sep	42													
Aug	41													
Jul	40													
Jun	39													
May	38													1-1-1
Apr	37													
Mar	36													4-4-4
Feb	35													
Jan	34													
Dec	33													
Nov	32													2-2-2
Oct	31													
Sep	30													1-1-1
Aug	29													
Jul	28													
Jun	27													
May	26													2-2-2
Apr	25													
Mar	24													9-9-9
Feb	23													
Jan	22													
Dec	21												0-0-4	4-4-0
Nov	20													
Oct	19											1-0-0	0-1-1	2-1-0
Sep	18											0-0-2	0-3-2	9-5-4
Aug	17													
Jul	16										0-0-1	0-0-1	2-3-0	1-0-1
Jun	15													
May	14													
Apr	13									0-5-1	6-5-1			
Mar	12							0-0-7	0-1-9	6-15-0	14-6-0	2-0-0		
Feb	11													
Jan	10							0-0-3	0-2-0	8-8-1				
Dec	9													
Nov	8							0-0-1	11-12-0	1-0-0				
Oct	7					(7-7-7)	0-1-0	8-7-0						
Sep	6					(3-3-3)	2-2-0	2-2-0						
Aug	5				(0-0-1)	(2-2-0)	1-2-0	1-0-0						
Jul	4				(0-0-2)	(2-2-0)								
Jun	3				(1-1-0)									
May	2	(0-0-2)		(0-0-1)	(0-2-0)	(3-1-0)								
Apr	1			(1-1-0)										
Mar	0	(0-1-0)	(1-0-0)											

P4 -	- P3 -	- P2
(dp4 -)	(- dp3 -)	(- dp2)

Appendix D.IV Dental development conversion charts for pig molars (after Carter and Magnell 2007). Numbers in the chart relate to the molars as follows:

M3 -	- M2 -	- M1

pig		Molar tooth development scores								
Age (months)		0	1	2	3	4	5	6	7	8
Mar	48									2-2-2
Feb	47									
Jan	46									
Dec	45									
Nov	44									
Oct	43									
Sep	42									
Aug	41									
Jul	40									
Jun	39									
May	38								1-0-0	0-1-1
Apr	37									
Mar	36								4-0-0	0-4-4
Feb	35									
Jan	34									
Dec	33									
Nov	32								2-0-0	0-2-2
Oct	31									
Sep	30								1-0-0	0-1-1
Aug	29									
Jul	28									
Jun	27									
May	26							2-0-0		0-2-2
Apr	25									
Mar	24						6-0-0	3-0-0		0-9-9
Feb	23									
Jan	22									
Dec	21						4-0-0			0-4-4
Nov	20									
Oct	19						2-0-0			0-2-2
Sep	18						9-0-0		0-4-0	0-5-9
Aug	17									
Jul	16					3-0-0			0-2-0	0-1-3
Jun	15									
May	14									
Apr	13				6-0-0		0-3-0	0-3-0		0-0-6
Mar	12			8-0-0	12-0-0	2-1-0	0-15-0	0-5-0	0-1-0	0-0-22
Feb	11									
Jan	10			7-0-0			0-8-0			0-0-8
Dec	9									
Nov	8			12-0-0		0-12-0				0-0-12
Oct	7		7-0-0	1-0-0		0-8-0			0-0-3	0-0-5
Sep	6		1-0-0		0-4-0				0-0-2	0-0-2
Aug	5		1-0-0		0-2-0				0-0-2	
Jul	4			0-2-0			0-0-2			
Jun	3				0-0-1					
May	2					0-0-3				
Apr	1				0-0-1					
Mar	0		0-0-1							

Appendix D.V Dental development conversion charts for red deer premolars (after Carter 2006). Numbers in the chart relate to the premolars as follows:

P4 -	- P3 -	- P2
(dp4 -)	(- dp3 -)	(- dp2)

red deer	Age (months)	Premolar tooth development scores													
		(7)	(8)	(9)	(10)	1	2	3	4	5	6	7	8	9	10
Apr	46								infundibulum unobservable in radiograph						2-2-2
Mar	45														
Feb	44														2-2-2
Jan	43														2-2-2
Dec	42														1-1-1
Nov	41														3-3-3
Oct	40													0-1-1	8-7-7
Sep	39													0-1-1	6-5-5
Aug	38														1-1-1
Jul	37														
Jun	36														
May	35													0-0-1	1-1-0
Apr	34													6-9-8	5-2-3
Mar	33													5-5-4	2-2-3
Feb	32													5-3-4	1-3-2
Jan	31												0-0-1	7-8-2	2-1-6
Dec	30												0-1-1	13-12-9	0-0-3
Nov	29												3-3-2	5-6-3	1-0-4
Oct	28												4-3-1	6-7-9	
Sep	27												7-6-4	5-6-8	
Aug	26												2-2-2		
Jul	25											2-1-1	0-1-1		
Jun	24														
May	23											1-1-1			
Apr	22											2-2-2			
Mar	21											1-1-0	0-0-1		
Feb	20											3-3-0	0-0-3		
Jan	19									0-0-1	5-3-1	2-4-3	0-0-2		
Dec	18									0-1-1	18-18-13	2-1-5	0-0-1		
Nov	17									3-3-2	2-2-1	0-0-2			
Oct	16							1-1-0		4-4-4	1-1-2				
Sep	15						0-0-1	2-2-1							
Aug	14							1-1-1							
Jul	13					1-2-2	1-0-0								
Jun	12				(1-1-1)	1-1-1									
May	11					1-1-1									
Apr	10					0-0-1									
Mar	9					0-0-1									
Feb	8			(1-4-2)	(4-3-1)	0-0-2									
Jan	7			(4-7-7)	(7-4-4)	1-3-6									
Dec	6			(6-6-5)	(0-0-1)	0-5-9									
Nov	5			(7-8-7)	(1-0-1)	0-1-3									
Oct	4														
Sep	3														
Aug	2		(1-1-1)												
Jul	1	(1-1-1)													
Jun	0														

Appendix D.VI Dental development conversion charts for red deer molars (after Carter 2006). Numbers in the chart relate to the molars as follows:

M3 -	- M2 -	- M1

red deer		Molar tooth development scores										
Age (months)		0	1	2	3	4	5	6	7	8	9	10
Apr	46											2-2-2
Mar	45											
Feb	44											2-2-2
Jan	43										1-0-0	1-2-2
Dec	42											1-1-1
Nov	41										2-0-0	1-3-3
Oct	40										2-0-0	6-8-8
Sep	39										2-0-0	4-6-6
Aug	38											1-1-1
Jul	37											
Jun	36											
May	35										1-0-0	0-1-1
Apr	34									5-0-0	5-6-0	1-5-11
Mar	33									4-0-0	3-2-0	0-5-7
Feb	32									3-0-0	3-4-0	0-2-6
Jan	31									6-0-0	3-8-0	0-1-9
Dec	30									11-0-0	2-10-0	0-3-13
Nov	29									5-0-0	4-9-1	0-0-8
Oct	28									9-1-0	1-6-1	0-3-9
Sep	27								2-0-0	8-1-0	2-7-2	0-4-10
Aug	26								1-0-0	1-1-0	0-1-0	0-0-2
Jul	25								2-0-0		0-2-0	0-0-2
Jun	24											
May	23								1-0-0		0-1-0	0-0-1
Apr	22								2-0-0		0-2-2	
Mar	21								1-0-0		0-1-1	
Feb	20							1-0-0	2-0-0	0-1-0	0-2-1	0-0-2
Jan	19						1-0-0	5-0-0	1-0-0	0-4-0	0-3-3	0-0-4
Dec	18						3-0-0	17-0-0	0-1-0	0-17-0	0-2-10	0-0-10
Nov	17						3-0-0	2-0-0		0-4-0	0-1-4	0-0-1
Oct	16					1-0-0	5-0-0			0-5-0	0-1-4	0-0-2
Sep	15					2-0-0			0-2-0		0-0-2	
Aug	14				1-0-0				0-1-0		0-0-1	
Jul	13			1-0-0	1-0-0				0-2-0		0-0-2	
Jun	12			1-0-0				0-1-0			0-0-1	
May	11		1-0-0					0-1-0			0-0-1	
Apr	10		1-0-0					0-1-0			0-0-1	
Mar	9			1-0-0				0-1-0			0-0-1	
Feb	8	2-0-0	3-0-0				0-2-0	0-3-0	0-0-1	0-0-4		
Jan	7	4-0-0	7-0-0		0-1-0		0-10-0		0-0-1	0-0-10		
Dec	6	9-0-0	7-0-0		0-11-0	0-5-0			0-0-9	0-0-7		
Nov	5	9-0-0	2-0-0		0-9-0	0-2-0			0-0-9	0-0-2		
Oct	4	1-0-0			0-1-0			0-0-1				
Sep	3											
Aug	2	1-1-0					0-0-1					
Jul	1	2-1-0	0-1-0	0-0-1		0-0-1						
Jun	0											

Appendix D.VII; Dental development conversion charts for roe deer premolars (after Carter 1997). Numbers in the chart relate to the premolars as follows:

P4 -	- P3 -	- P2
(dp4 -)	(- dp3 -)	(- dp2)

roe deer			Premolar tooth development scores												
			(8)	(9)	(10)	1	2	3	4	5	6	7	8	9	10
Age (months)	Oct	16							Infundibulum unobservable in radiograph					2-1-0	2-3-4
	Sep	15												1-1-0	1-1-2
	Aug	14											2-2-1	3-1-2	1-3-3
	Jul	13											2-0-0	2-4-3	0-0-1
	Jun	12											6-6-3	0-0-3	
	May	11										4-4-1	0-0-3		
	Apr	10									4-4-2	6-5-6	3-4-5		
	Mar	9								0-0-2	6-6-4				
	Feb	8						0-0-2		6-5-3	2-3-3				
	Jan	7				0-0-1	1-2-2	9-9-12		6-6-2	1-0-0				
	Dec	6				0-2-3	6-5-6	9-8-6							
	Nov	5				9-9-15	10-10-6	2-2-0							
	Oct	4		(1-1-1)		8-8-8									
	Sep	3		(1-2-2)	(1-0-0)										
	Aug	2		(3-3-3)											
	Jul	1	(1-1-0)												
	Jun	0													

Appendix D.VIII Dental development conversion charts for roe deer molars (after Carter 1997). Numbers in the chart relate to the molars as follows:

M3 -	- M2 -	- M1

roe deer			Molar tooth development scores									
			1	2	3	4	5	6	7	8	9	10
Age (months)	Oct	16									2-0-0	0-2-2
	Sep	15										2-2-2
	Aug	14							1-0-0	1-0-0	3-1-0	1-5-6
	Jul	13								1-0-0	3-0-0	0-4-4
	Jun	12							1-0-0	3-0-0	2-2-0	0-4-6
	May	11						1-0-0	3-0-0		0-1-0	0-3-4
	Apr	10						6-0-0	5-0-0	2-0-0	0-7-0	0-6-13
	Mar	9					1-0-0	5-0-0			0-4-1	0-2-5
	Feb	8				3-0-0	3-0-0	2-0-0		0-2-0	0-6-2	0-0-6
	Jan	7			2-0-0	6-0-0	7-0-0	2-0-0		0-7-0	0-10-7	0-0-10
	Dec	6		1-0-0	10-0-0	3-0-0	1-0-0		0-5-0	0-7-0	0-3-12	0-0-3
	Nov	5	1-0-0	9-0-0	11-0-0		0-1-0	0-3-0	0-14-0	0-3-3	0-0-18	
	Oct	4	2-0-0	7-0-0		0-1-0	0-2-0	0-6-0		0-0-5	0-0-4	
	Sep	3				0-2-0			0-0-2			
	Aug	2		0-1-0	0-2-0			0-0-1	0-0-2			
	Jul	1	0-1-0				0-0-1					
	Jun	0										

Appendix D.IX; Radiograph results from archaeological samples by species, site and date.

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
13464	Caprine	Batten Hanger	AD250-400	0	0	0	0	0	0	9	8	6	24-32
13466	Caprine	Batten Hanger	AD250-400	0	0	0	0	0	0	10	9	9	31-55
13462	Caprine	Batten Hanger	AD250-400	0	0	0	0	0	0	0	6	0	15-23
13460	Caprine	Batten Hanger	AD250-400	0	0	0	0	0	0	0	9	8	32-43
13461	Caprine	Batten Hanger	AD250-400	0	0	0	0	0	8	8	7	5	24-25
13465	Caprine	Batten Hanger	AD250-400	0	0	0	0	7	7	8	6	0	22
13459*	Sheep	Batten Hanger	AD250-400	9	9	8	0	0	0	0	0	0	5
13463*	Sheep	Batten Hanger	AD250-400	0	0	9	0	0	0	6	0	0	6-10
11248	Caprine	Carne's Seat	late Iron Age/early Roman	0	0	0	0	0	0	0	7	6	24-26
10910	Caprine	Carne's Seat	mid-late Iron Age	0	0	0	0	0	8	9	7	0	25-26
10911	Caprine	Carne's Seat	mid-late Iron Age	0	0	0	0	0	0	0	0	6	24-32
10916	Pig	Carne's Seat	mid-late Iron Age	0	0	0	0	7	0	8	8	6	16
10387	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	9	9	31-55
10252	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	9	8	8	8	5	24-25
10253	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	0	8	25-32
10247	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	0	8	32-43
10248	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	8	8	0	9	8	6	28-31
10209	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	8	6	0	15-23
10453	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	9	10	9	8	25-32
10508	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	6	6	6	8	6	0	17-23
10218	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	9	0	32-51
10413	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	0	8	32-43
10432	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	7	8	8	8	7	0	22-24
10431	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	9	8	6	24-32
10365	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	10	9	9	31-55
10364	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	5	2	0	1-5
10366	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	9	8	8	31-36
10368	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	9	10	8	7	31-36
10369	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	8	0	8	7	6	24-28
10367	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	1	1	3	7	5	1	10-11
10416	Caprine	Chichester CM	1st-2ndC.AD	0	0	10	0	0	5	8	7	4	17-20
10417	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	8	8	7	24
10385	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	10	10	9	9	31-55
10388	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	9	7	6	24-26
10390	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	10	10	10	10	mature
10389	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	10	9	8	8	32-43
10306	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	9	9	8	8	0	24
10307	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	8	8	9	6	0	22-23
10305	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	10	10	mature
33	Caprine	Chichester CM	1st-2ndC.AD	10	10	9	0	0	0	6	4	0	6-8
10308	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	9	9	9	8	7	6	24
10217	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	9	9	9	8	5	24-25
10377	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	10	10	10	mature
10380	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	0	6	24-32
10381	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	9	9	8	8	0	24
10379	Caprine	Chichester CM	1st-2ndC.AD	9	9	9	0	0	0	7	0	0	10-11
10474	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	9	8	7	28-43

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
10378	Caprine	Chichester CM	1st-2ndC.AD	10	9	9	0	0	0	5	0	0	10-11
10214	Caprine	Chichester CM	1st-2ndC.AD	0	0	10	5	5	5	8	7	0	17-24
10376	Caprine	Chichester CM	1st-2ndC.AD	10	10	10	0	1	1	8	6	2	15
10312	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	10	10	10	10	mature
10335	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	8	7	4	17-20
10210	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	10	10	8	8	32-43
10428	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	9	8	8	0	0	24-25
10429	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	10	10	9	31-55
10360	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	9	8	32-43
10359	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	10	10	9	9	31-55
10430	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	8	7	5	17-24
10427	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	9	9	9	9	8	5	24-25
10370	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	10	10	10	mature
10159	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	9	8	31-43
10158	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	8	9	7	0	25-26
10160	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	10	10	10	mature
10324	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	9	10	9	8	32-43
10325	Caprine	Chichester CM	1st-2ndC.Ad	0	0	0	0	9	9	9	9	8	32-43
10293	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	1	2	5	8	0	0	17-18
10295	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	8	7	31-43
10297	Caprine	Chichester CM	1st-2ndC.AD	10	10	8	0	0	0	5	0	0	5-10
10298	Caprine	Chichester CM	1st-2ndC.AD	0	0	10	5	5	6	8	7	0	17-24
10294	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	10	10	8	8	32-43
10148	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	9	9	31-55
10152	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	8	8	32-43
10161	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	10	10	mature
10149	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	8	8	8	7	0	24-28
10150	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	8	6	5	17-23
10133	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	9	8	32-43
10201	Caprine	Chichester CM	1st-2ndC.AD	0	9	9	0	0	0	7	5	0	10-11
10212	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	8	8	9	7	5	22-25
10173	Caprine	Chichester CM	1st-2ndC.AD	10	10	10	1	3	5	8	6	0	18
10490	Caprine	Chichester CM	1st-2ndC.AD	0	0	10	0	0	5	8	7	0	17-24
10492	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	8	8	9	8	6	28-31
10260	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	9	9	31-55
10261	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	9	8	9	9	6	31-32
10128	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	8	8	32-43
10491	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	0	0	mature?
10147	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	10	10	9	9	8	7	28-31
10310	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	0	8	32-43
10211	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	6	6	7	8	0	0	22-24
10178	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	3	0	5
10179	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	3	5	6	8	6	0	18
10139	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	9	9	9	9	8	32-43
10138	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	10	10	10	10	10	mature
13468	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	0	5	5	0	0	0	17-24
10132	Caprine	Chichester CM	1st-2ndC.AD	9	9	8	0	0	0	0	0	0	5
10289	Caprine	Chichester CM	1st-2ndC.AD	0	0	0	6	0	8	9	7	5	24-25

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
10274	Caprine	Chichester CM	1st-2ndC.AD	9	9	8	0	0	0	5	0	0	5
10273	Caprine	Chichester CM	1st-2ndC.AD	10	9	9	0	0	0	6	0	0	10
10251	Caprine	Chichester CM	1st-2ndC.AD	7	8	7	0	0	0	0	0	0	1
10203	Caprine	Chichester CM	1st-4thC.AD	0	0	0	0	10	10	10	9	9	39-55
10477	Caprine	Chichester CM	1st-4thC.AD	0	0	0	0	0	0	0	0	6	26-32
10145	Caprine	Chichester CM	1st-4thC.AD	0	0	0	0	0	0	0	8	8	32-43
10146	Caprine	Chichester CM	1st-4thC.AD	0	10	10	3	5	5	8	6	0	17-23
10144	Caprine	Chichester CM	1st-4thC.AD	0	0	0	0	9	0	9	7	6	24-26
10348	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	8	8	0	8	6	0	15-23months
10000	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	0	10	mature
10505	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	10	10	mature
10506	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	0	10	10	10	mature
10125	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	10	10	8	0	24-43
10198	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	0	8	32-43
10511	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	10	10	10	mature
10220	Caprine	Chichester CM	2nd-3rdC.AD	0	8	8	0	0	0	0	0	0	1
10221	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	6	3	0	5
10222	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	9	9	9	8	8	32-43
10270	Caprine	Chichester CM	2nd-3rdC.AD	0	8	8	0	0	0	9	7	5	22-25
10267	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	10	9	0	31-55
10269	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	10	0	mature
10271	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	9	8	6	24-32
10268	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	10	10	mature
10266	Caprine	Chichester CM	2nd-3rdC.AD	9	9	9	0	0	0	5	0	0	5-6
10205	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	9	8	32-43
10208	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	9	8	9	8	5	25
10448	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	9	9	9	7	6	24-26
10451	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	8	8	8	6	0	15-23
10450	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	10	10	mature
10447	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	9	8	7	31-43
10449	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	10	10	10	10	10	10	mature
10452	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	9	9	31-55
10441	Caprine	Chichester CM	2nd-3rdC.AD	0	0	10	3	3	3	8	6	0	18
10438	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	10	9	31-55
10440	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	9	8	8	7	24
10443	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	9	9	8	8	0	24
10439	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	10	9	31-55
10444	Caprine	Chichester CM	2nd-3rdC.AD	9	9	9	0	0	0	6	4	1	8
10445	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	9	9	8	32-43
10442	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	8	8	7	5	24-25
10397	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	9	0	0	31-45
10336	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	10	9	31-55
10411	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	10	10	mature
10414	Caprine	Chichester CM	2nd-3rdC.AD	0	10	10	5	5	5	8	6	0	17-23
10405	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	10	9	31-55
10403	Caprine	Chichester CM	2nd-3rdC.AD	0	10	0	1	1	0	8	6	0	15
10171	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	10	10	10	mature
10481	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	9	9	9	8	32-43

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
10480	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	5	6	6	8	7	4	17-20
10479	Caprine	Chichester CM	2nd-3rdC.AD	0	0	9	0	0	0	7	0	0	10-11
10478	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	9	8	8	9	0	0	30-31
10420	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	9	8	31-43
10142	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	8	8	8	0	0	24-25
10195	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	0	9	31-55
10196	Caprine	Chichester CM	2nd-3rdC.AD	0	0	0	0	10	10	10	9	9	31-55
10507	Caprine	Chichester CM	2nd-3rdC.AD	10	9	8	0	0	0	4	1	0	1
10463	Caprine	Chichester CM	2nd-3rdC.AD	9	9	8	0	0	0	0	0	0	30-32
10140	Caprine	Chichester CM	3rd-4thC.AD	0	0	0	0	0	0	0	10	9	39-55
10486	Caprine	Chichester CM	3rd-4thC.AD	0	0	0	0	0	0	8	7	6	24-26
10487	Caprine	Chichester CM	3rd-4thC.AD	0	0	8	0	0	0	4	0	0	1
10488	Caprine	Chichester CM	3rd-4thC.AD	0	0	0	0	0	8	8	7	6	26
10468	Caprine	Chichester CM	3rd-4thC.AD	0	0	0	0	0	0	10	9	9	31-55
10467	Caprine	Chichester CM	3rd-4thC.AD	0	0	0	9	0	0	10	0	0	31-55
10192	Caprine	Chichester CM	3rd-4thC.AD	0	0	0	6	7	7	8	7	0	22-24
10193	Caprine	Chichester CM	3rd-4thC.AD	0	0	0	8	8	8	9	8	6	28-31
10313	Caprine	Chichester CM	AD43-60	0	0	0	0	10	10	9	9	9	31-45
10314	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	6	4	0	6-8
10233	Caprine	Chichester CM	AD43-60	0	0	0	9	9	0	9	8	7	30-43
10227	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	10	10	10	mature
10226	Caprine	Chichester CM	AD43-60	0	0	0	0	10	9	9	0	8	32-43
10229	Caprine	Chichester CM	AD43-60	10	10	10	1	1	2	8	6	0	17-18
10228	Caprine	Chichester CM	AD43-60	0	0	9	0	0	0	6	3	0	5
10230	Caprine	Chichester CM	AD43-60	0	9	9	1	0	0	6	0	0	5-10
10224	Caprine	Chichester CM	AD43-60	10	9	9	0	0	0	6	0	0	5-10
10384	Caprine	Chichester CM	AD43-60	0	0	0	9	8	8	9	8	0	30-32
10499	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	9	8	8	32-36
10498	Caprine	Chichester CM	AD43-60	0	0	0	0	8	8	9	7	6	25-26
10339	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	9	6	5	22-23
10341	Caprine	Chichester CM	AD43-60	0	0	0	0	2	3	8	0	0	18-20
10001	Caprine	Chichester CM	AD43-60	0	0	0	0	9	0	0	0	0	25-55
10340	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	0	8	7	28-43
10301	Caprine	Chichester CM	AD43-60	0	0	0	0	9	9	9	7	6	17-23
10300	Caprine	Chichester CM	AD43-60	0	0	0	0	0	10	10	8	8	32-43
10326	Caprine	Chichester CM	AD43-60	0	0	0	0	0	10	10	10	10	mature
10255	Caprine	Chichester CM	AD43-60	0	0	0	0	0	10	9	8	8	32-43
10254	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	0	5	1	8-11
10249	Caprine	Chichester CM	AD43-60	0	0	0	0	9	9	8	8	6	24
10458	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	9	9	8	32-43
10240	Caprine	Chichester CM	AD43-60	0	0	0	9	9	9	9	8	7	30-43
10241	Caprine	Chichester CM	AD43-60	0	0	0	0	10	10	10	10	10	mature
10242	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	9	7	7	24-26
10239	Caprine	Chichester CM	AD43-60	0	0	0	0	6	0	8	7	4	17-20
10276	Caprine	Chichester CM	AD43-60	0	10	10	0	0	3	7	5	2	10-11
10275	Caprine	Chichester CM	AD43-60	0	0	0	0	10	10	10	10	10	mature
10277	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	0	7	5	17-25
10345	Caprine	Chichester CM	AD43-60	0	0	0	0	0	3	8	6	3	15

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
10281	Caprine	Chichester CM	AD43-60	0	0	0	2	3	5	8	6	0	17-20
10285	Caprine	Chichester CM	AD43-60	0	0	0	0	9	9	10	9	8	32-43
10283	Caprine	Chichester CM	AD43-60	10	10	9	0	0	0	6	2	0	6-10
10284	Caprine	Chichester CM	AD43-60	0	0	9	0	0	0	6	5	0	8-10
10282	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	4	0	0	1
10185	Caprine	Chichester CM	AD43-60	0	0	0	0	9	9	9	8	6	30-32
10186	Caprine	Chichester CM	AD43-60	0	0	0	0	9	9	8	7	5	17-24
10156	Caprine	Chichester CM	AD43-60	0	0	10	1	3	3	8	6	5	18
10157	Caprine	Chichester CM	AD43-60	0	10	10	0	0	0	8	6	0	15-23
10197	Caprine	Chichester CM	AD43-60	0	0	0	0	10	10	10	10	10	mature
10329	Caprine	Chichester CM	AD43-60	0	0	9	0	0	0	8	6	2	15
10122	Caprine	Chichester CM	AD43-60	0	0	0	0	10	9	9	8	7	28-31
10334	Caprine	Chichester CM	AD43-60	0	0	0	0	0	0	5	0	0	5
10332	Caprine	Chichester CM	AD43-60	0	0	0	0	10	10	10	8	0	31-43
10333	Caprine	Chichester CM	AD43-60	0	0	8	0	0	0	5	2	0	5
10331	Caprine	Chichester CM	AD43-60	0	10	8	0	0	0	5	0	0	5
10361	Caprine	Chichester CM	late Iron Age	0	0	0	0	0	10	10	9	8	32-43
10303	Pig	Chichester CM	1st-2ndC.AD	8	8	8	2	2	3	7	4	2	7
10363	Pig	Chichester CM	1st-2ndC.AD	0	8	8	1	1	1	7	0	0	5-6
10168	Pig	Chichester CM	1st-2ndC.AD	8	8	8	2	3	4	7	4	2	8-12
10167	Pig	Chichester CM	1st-2ndC.AD	8	8	8	2	3	0	7	4	0	12
10183	Pig	Chichester CM	1st-2ndC.AD	0	8	8	0	2	2	0	0	0	6-7
10180	Pig	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	7	3	12-13
10280	Pig	Chichester CM	1st-2ndC.AD	0	0	0	0	0	8	8	8	5	18-24
10462	Pig	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	8	4	12-16
10372	Pig	Chichester CM	1st-2ndC.AD	0	0	0	0	7	8	8	8	0	16-19
10493	Pig	Chichester CM	1st-2ndC.AD	0	0	0	0	8	8	8	8	8	mature
10401	Pig	Chichester CM	1st-2ndC.AD	0	0	0	0	8	8	0	0	0	mature
10410	Pig	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	8	8	5	18-24
10291	Pig	Chichester CM	1st-2ndC.AD	0	8	0	2	4	5	8	0	0	12
10292	Pig	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	8	6	24-26
10496	Pig	Chichester CM	1st-2ndC.AD	0	0	0	6	7	0	0	0	0	16-18
10174	Pig	Chichester CM	1st-2ndC.AD	0	0	0	8	8	8	8	8	7	30-38
10362	Pig	Chichester CM	1st-2ndC.AD	0	0	0	7	8	8	8	8	6	18-21
10392	Pig	Chichester CM	1st-2ndC.AD	0	0	0	0	7	8	0	0	0	16-19
10393	Pig	Chichester CM	1st-2ndC.AD	0	0	0	0	0	0	0	0	7	30-38
10418	Pig	Chichester CM	1st-2ndC.AD	0	0	0	5	7	8	8	7	4	16
10172	Pig	Chichester CM	1st-2ndC.AD	0	0	0	6	0	7	8	8	0	16
10503	Pig	Chichester CM	2nd-3rdC.AD	0	8	8	5	5	3	8	0	0	12-13
10402	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	7	4	2	7
10415	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	8	7	4	12-16
10459	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	8	5	18-24
10188	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	8	8	6	24-26
10189	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	7	3	12-13
10177	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	8	8	8	0	8	7	30-38
10356	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	7	7	8	0	0	16
10164	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	8	7	30-38
10166	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	7	8	8	0	18-21

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
10165	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	7	5	18
10437	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	7	7	8	8	8	0	18-21
10436	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	7	7	8	8	0	0	18-21
10434	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	8	8	8	8	7	30-38
10435	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	8	7	0	12-18
10170	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	0	6	24-26
10175	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	8	6	0	12-13
10315	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	0	7	30-38
10460	Pig	Chichester CM	2nd-3rdC.AD	0	0	0	0	0	0	0	8	6	24-26
10163	Pig	Chichester CM	3rd-4thC.AD	0	0	0	0	0	0	0	8	5	18-24
10466	Pig	Chichester CM	3rd-4thC.AD	0	0	0	0	0	0	0	0	7	30-38
10338	Pig	Chichester CM	AD43-60	0	0	0	0	0	0	0	8	6	24-26
10337	Pig	Chichester CM	AD43-60	0	7	8	0	0	0	4	0	0	2
10225	Pig	Chichester CM	AD43-60	0	0	8	0	0	4	0	0	0	8-12
10200	Pig	Chichester CM	AD43-60	0	0	8	0	0	4	8	0	0	8-12
10162	Pig	Chichester CM	AD43-60	0	0	0	0	0	0	8	7	4	12-16
10234	Pig	Chichester CM	AD43-60	0	0	0	0	0	0	8	8	0	18-24
10237	Pig	Chichester CM	AD43-60	0	0	0	0	7	8	8	7	5	18
10030	Pig	Chichester CM	AD43-60	0	8	8	0	0	0	8	0	0	12-13
10346	Pig	Chichester CM	AD43-60	0	0	0	0	0	0	0	0	6	24-26
0	Roe deer	Chichester CM	Roman	0	0	0	10	10	10	10	10	10	mature
10349*	Sheep	Chichester CM	2nd-3rdC.AD	0	9	9	0	0	0	5	0	0	5-11
10347*	Sheep	Chichester CM	2nd-3rdC.AD	0	0	9	0	0	0	6	4	0	6-8
10350*	Sheep	Chichester CM	2nd-3rdC.AD	9	9	9	0	0	0	7	5	1	10-11
10265*	Sheep	Chichester CM	2nd-3rdC.AD	9	9	9	0	0	0	5	3	0	5-6
10264*	Sheep	Chichester CM	2nd-3rdC.AD	0	10	9	0	0	0	0	0	0	6-18
13453	Caprine	Elstead	AD100-250	0	0	0	0	10	9	9	7	6	24-26
13451	Caprine	Elstead	AD100-250	0	0	0	0	8	7	0	0	0	22-31
13450	Caprine	Elstead	AD100-250	0	0	0	0	0	0	0	0	10	mature
13458	Caprine	Elstead	AD100-250	0	0	0	10	10	10	10	9	8	32-43
13446	Caprine	Elstead	AD100-250	0	0	0	0	0	0	0	10	10	mature
13441	Caprine	Elstead	AD100-250	0	0	0	0	0	10	10	10	10	mature
13445	Caprine	Elstead	AD100-250	0	0	0	0	0	0	7	0	0	10-11
13440	Caprine	Elstead	AD100-250	0	0	0	0	0	0	0	6	0	24-32
13455	Caprine	Elstead	AD100-250	0	0	0	0	0	0	0	6	0	15-23
13452	Caprine	Elstead	AD100-250	0	0	0	0	0	0	9	8	7	28-43
13456	Caprine	Elstead	AD100-250	0	0	0	0	0	0	10	8	0	31-43
13457	Caprine	Elstead	AD100-250	0	0	0	0	0	0	0	0	7	28-43
13447	Caprine	Elstead	AD100-250	0	0	0	0	0	0	0	0	0	mature
13448	Caprine	Elstead	AD100-250	0	0	0	0	0	0	0	0	0	mature
13442	Caprine	Elstead	AD100-250	0	0	0	0	0	0	7	0	0	10-11
13454	Caprine	Elstead	AD100-250	0	0	0	6	6	5	9	6	0	22-23
13439*	Sheep	Elstead	AD100-250	0	10	9	0	0	0	6	5	0	8-10
160	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	9	9	9	8	7	30-43
159	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	10	10	9	9	6	31-32
161	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	10	9	10	8	6	31-32
695	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	0	0	0	10	10	mature
530	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	9	9	9	9	8	0	30-43

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
546	Caprine	Fishbourne (FB61-68)	AD100-140	0	8	7	0	0	0	0	0	0	1
2545	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	9	9	9	9	6	31-32
2541	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	3	5	5	0	0	0	18
2543	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	8	8	10	0	0	31
2542	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	10	10	10	0	0	mature?
2546	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	0	0	10	8	7	31-43
5671	Caprine	Fishbourne (FB61-68)	AD100-140	10	9	8	0	0	0	5	0	0	5-10
5672	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	10	10	0	0	0	mature?
4666	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	0	10	10	10	10	mature
4538	Caprine	Fishbourne (FB61-68)	AD100-140	10	9	0	0	0	0	0	0	0	10-11
7373	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	0	9	9	8	0	31-43
7372	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	10	9	9	0	0	31-45
4992	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	0	0	0	8	7	28-43
5670	Caprine	Fishbourne (FB61-68)	AD100-140	0	0	0	0	0	0	0	7	0	17-26
892	Caprine	Fishbourne (FB61-68)	AD140-180	0	0	9	0	0	0	6	0	0	6-10
5851	Caprine	Fishbourne (FB61-68)	AD140-180	0	0	0	0	0	0	0	0	6	24-32
5904	Caprine	Fishbourne (FB61-68)	AD140-180	0	0	0	10	10	9	9	0	0	31-45
4718	Caprine	Fishbourne (FB61-68)	AD140-180	0	0	0	0	9	9	9	7	6	24-26
6618	Caprine	Fishbourne (FB61-68)	AD140-180	0	0	0	0	0	0	10	8	6	31-32
6529	Caprine	Fishbourne (FB61-68)	AD140-180	0	0	0	5	7	0	0	0	0	22
7106	Caprine	Fishbourne (FB61-68)	AD140-180	0	0	0	0	0	0	8	6	4	17-20
5855	Caprine	Fishbourne (FB61-68)	AD140-180	0	0	0	0	0	0	0	7	6	24-26
432	Caprine	Fishbourne (FB61-68)	AD180-250	0	0	0	0	0	0	0	9	9	31-55
431	Caprine	Fishbourne (FB61-68)	AD180-250	0	0	0	0	0	0	0	8	5	24-25
4325	Caprine	Fishbourne (FB61-68)	AD180-250	0	0	0	0	0	0	10	10	10	mature
4322	Caprine	Fishbourne (FB61-68)	AD180-250	0	0	0	0	10	0	0	0	0	
4367	Caprine	Fishbourne (FB61-68)	AD180-250	0	0	0	0	0	0	0	9	6	24-25
3677	Caprine	Fishbourne (FB61-68)	AD180-250	0	0	0	0	0	0	9	7	0	22-26
639	Caprine	Fishbourne (FB61-68)	AD250-280	0	9	8	0	0	0	0	0	0	5
2011	Caprine	Fishbourne (FB61-68)	AD43-45	0	0	0	10	10	10	0	0	0	mature?
2010	Caprine	Fishbourne (FB61-68)	AD43-45	0	0	0	0	0	0	0	10	9	31-55
3446	Caprine	Fishbourne (FB61-68)	AD43-45	0	0	0	0	0	10	10	9	9	31-55
139	Caprine	Fishbourne (FB61-68)	AD43-75	0	0	0	0	2	3	8	0	0	17-20
2302	Caprine	Fishbourne (FB61-68)	AD43-75	10	9	9	0	0	0	6	4	0	6-8
68	Caprine	Fishbourne (FB61-68)	AD43-75	0	0	0	10	10	10	10	0	0	mature?
2301	Caprine	Fishbourne (FB61-68)	AD43-75	0	0	0	0	0	0	0	10	10	mature
2435	Caprine	Fishbourne (FB61-68)	AD43-75	0	0	0	0	9	10	10	8	0	31-43
7416	Caprine	Fishbourne (FB61-68)	AD43-75	0	0	0	0	0	0	0	6	4	17-20
7	Caprine	Fishbourne (FB61-68)	AD45-75	0	0	0	0	9	9	10	8	6	31-32
3736	Caprine	Fishbourne (FB61-68)	AD45-75	0	0	0	0	10	9	9	9	9	31-45
5249	Caprine	Fishbourne (FB61-68)	AD45-75	10	9	9	0	0	0	5	0	0	5-6
5221	Caprine	Fishbourne (FB61-68)	AD45-75	0	0	0	0	9	9	9	7	5	22-25
5222	Caprine	Fishbourne (FB61-68)	AD45-75	0	10	9	0	0	0	5	0	0	5-6
4603	Caprine	Fishbourne (FB61-68)	AD45-75	9	9	9	0	0	0	6	0	0	6-10
1168	Caprine	Fishbourne (FB61-68)	AD45-75	0	0	0	0	10	10	10	10	9	31-55
4602	Caprine	Fishbourne (FB61-68)	AD45-75	0	0	0	0	0	0	0	6	6	23-24
1105	Caprine	Fishbourne (FB61-68)	AD45-75	0	0	0	0	0	0	0	6	5	17-19
487	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	8	8	9	7	6	24-26

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
400	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	0	0	6	24-32
349	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	8	9	8	5	25
2376	Caprine	Fishbourne (FB61-68)	AD75-80	9	9	8	0	0	0	0	0	0	5
79	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	3	5	8	0	0	17-20
1849	Caprine	Fishbourne (FB61-68)	AD75-80	0	10	0	2	2	3	8	6	0	18-20
2183	Caprine	Fishbourne (FB61-68)	AD75-80	10	10	9	0	0	0	6	4	1	8
1333	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	10	10	9	9	31-55
906	Caprine	Fishbourne (FB61-68)	AD75-80	10	9	8	0	0	0	5	0	0	5-6
979	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	10	0	2	5	8	0	0	17-20
3163	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	10	10	9	8	8	32-43
560	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	6	6	0	0	0	0	17-24
2968	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	10	0	9	8	0	31-43
2715	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	0	5	0	8
2967	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	8	0	0	15-24
2966	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	10	10	0	0	mature?
2711	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	10	2	3	5	8	6	0	17-20
2714	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	0	7	6	24-26
2710	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	10	0	10	0	0	mature?
2727	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	10	10	10	10	10	10	mature
2572	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	9	9	9	7	5	22-25
3406	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	1	2	3	8	5	0	18
4401	Caprine	Fishbourne (FB61-68)	AD75-80	0	9	9	0	0	0	0	0	0	6-11
3879	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	9	9	9	8	0	31-43
3660	Caprine	Fishbourne (FB61-68)	AD75-80	0	8	8	0	0	0	0	0	0	1
3185	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	9	9	9	9	8	6	30-32
3186	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	9	9	9	8	6	30-32
3183	Caprine	Fishbourne (FB61-68)	AD75-80	0	10	10	0	1	2	8	6	0	15
5458	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	0	0	0	obscure xray: likely mature
4820	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	9	8	7	28-43
4819	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	0	0	9	31-55
7845	Caprine	Fishbourne (FB61-68)	AD75-80	0	10	0	0	9	9	9	7	6	25-26
4818	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	0	6	5	17-23
2713	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	0	0	5	17-25
2712	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	0	0	7	28-43
87	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	10	8	7	31-43
5551	Caprine	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	8	5	0	11-15
680	Caprine	Fishbourne (FB61-68)	AD80-100	0	0	0	0	0	6	9	6	0	22-23
3343	Caprine	Fishbourne (FB61-68)	AD80-100	0	0	0	2	3	0	0	0	0	17-20
6017	Caprine	Fishbourne (FB61-68)	AD80-100	0	0	0	0	0	0	0	0	7	28-43
7336	Caprine	Fishbourne (FB61-68)	AD80-100	0	10	10	1	1	3	6	0	0	5-10
5930	Caprine	Fishbourne (FB61-68)	AD80-100	0	0	0	1	2	2	8	6	4	17-18
7228	Caprine	Fishbourne (FB61-68)	AD80-100	0	0	0	0	9	9	10	8	0	31-43
7163	Caprine	Fishbourne (FB61-68)	AD80-100	0	0	0	0	10	10	10	10	10	mature
7337	Caprine	Fishbourne (FB61-68)	AD80-100	0	0	0	0	0	10	10	10	10	mature
7229	Caprine	Fishbourne (FB61-68)	AD80-100	0	0	0	0	10	10	10	0	0	
7408	Caprine	Fishbourne (FB61-68)	ADAD43-75	0	10	10	1	1	2	8	6	0	15
4127	Caprine	Fishbourne (FB61-68)	ADAD45-75	10	10	9	0	0	0	7	0	0	10-11
6154	Caprine	Fishbourne (FB61-68)	post-AD250	0	0	0	0	7	5	9	0	0	22-24

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
129	Caprine	Fishbourne (FB61-68)	post-AD280	0	0	0	10	9	9	9	9	6	31-32
730	Caprine	Fishbourne (FB61-68)	post-AD280	0	10	10	3	5	5	8	6	0	17-23
3052	Caprine	Fishbourne (FB61-68)	post-AD280	0	0	0	0	10	10	10	8	0	31-43
3667	Caprine	Fishbourne (FB61-68)	post-AD280	0	0	0	0	9	9	9	7	0	22-26
3371	Caprine	Fishbourne (FB61-68)	post-AD280	0	0	10	0	0	5	8	6	4	17-20
6037	Caprine	Fishbourne (FB61-68)	post-AD280	0	0	0	10	10	9	9	9	7	31-43
1335	Caprine	Fishbourne (FB61-68)	post-AD280	0	0	0	0	10	10	10	10	10	mature
6280	Caprine	Fishbourne (FB61-68)	post-AD280	0	0	0	0	10	9	9	9	7	31-43
1081	Caprine	Fishbourne (FB61-68)	post-AD280	0	0	0	0	0	0	0	7	5	17-25
6469	Caprine	Fishbourne (FB61-68)	post-AD280	0	0	0	0	0	8	9	7	0	25-26
6173	Caprine	Fishbourne (FB61-68)	post-AD280	0	0	0	0	0	0	9	6	0	22-23
7721**	Goat	Fishbourne (FB61-68)	AD43-75	0	8	7	0	0	0	4	0	0	1
4547	Pig	Fishbourne (FB61-68)	AD100-140	0	8	8	1	1	1	6	0	0	5-6
10880	Pig	Fishbourne (FB61-68)	AD100-140	0	0	0	0	0	0	0	8	4	16
10903	Pig	Fishbourne (FB61-68)	AD100-140	0	0	0	0	0	0	8	8	7	30-38
10898	Pig	Fishbourne (FB61-68)	AD100-140	0	0	8	0	0	0	8	4	2	7
10894	Pig	Fishbourne (FB61-68)	AD100-140	0	0	7	0	0	0	0	0	0	3
706	Pig	Fishbourne (FB61-68)	AD120-140	0	0	0	0	0	6	8	7	0	12
2747	Pig	Fishbourne (FB61-68)	AD140-180	0	7	7	0	0	0	5	0	0	3
4708	Pig	Fishbourne (FB61-68)	AD140-180	0	8	8	0	1	0	0	0	0	5-7
10852	Pig	Fishbourne (FB61-68)	AD140-180	0	0	0	0	0	0	0	8	7	30-38
10879	Pig	Fishbourne (FB61-68)	AD140-180	0	7	7	0	0	0	3	0	0	3
3685	Pig	Fishbourne (FB61-68)	AD180-250	0	0	0	6	7	7	0	0	0	22-24
4299	Pig	Fishbourne (FB61-68)	AD180-250	8	8	8	3	5	5	0	0	0	12
455	Pig	Fishbourne (FB61-68)	AD180-250	0	0	8	3	5	6	7	6	2	12
456	Pig	Fishbourne (FB61-68)	AD180-250	0	0	0	0	0	0	8	8	7	30-38
459	Pig	Fishbourne (FB61-68)	AD180-250	0	0	0	0	0	0	8	8	7	30-38
277	Pig	Fishbourne (FB61-68)	AD43-75	0	0	0	0	0	0	0	8	6	24-26
2348	Pig	Fishbourne (FB61-68)	AD43-75	0	0	0	0	0	0	0	7	4	12-16
10902	Pig	Fishbourne (FB61-68)	AD43-75	0	0	0	0	0	0	0	8	7	30-38
10906	Pig	Fishbourne (FB61-68)	AD43-75	0	0	0	0	0	8	8	8	7	30-38
10890	Pig	Fishbourne (FB61-68)	AD43-75	0	0	0	0	0	0	0	8	7	30-38
10877	Pig	Fishbourne (FB61-68)	AD43-75	8	8	8	1	2	3	0	0	0	6-8
10876	Pig	Fishbourne (FB61-68)	AD43-75	0	0	8	0	1	1	7	0	0	5-6
10873	Pig	Fishbourne (FB61-68)	AD43-75	0	0	0	0	0	0	0	8	7	30-38
562	Pig	Fishbourne (FB61-68)	AD45-75	0	0	0	0	0	0	0	8	6	24-26
4959	Pig	Fishbourne (FB61-68)	AD45-75	0	0	0	0	0	0	0	5	0	10-13
4961	Pig	Fishbourne (FB61-68)	AD45-75	0	0	8	0	3	3	8	0	0	8
812	Pig	Fishbourne (FB61-68)	AD45-75	0	8	8	0	1	1	0	0	0	5-6
811	Pig	Fishbourne (FB61-68)	AD45-75	0	0	7	0	0	0	0	0	0	3
10893	Pig	Fishbourne (FB61-68)	AD45-75	0	0	0	0	0	0	0	8	5	18-24
10889	Pig	Fishbourne (FB61-68)	AD45-75	8	8	8	1	1	1	7	0	0	5-6
228	Pig	Fishbourne (FB61-68)	AD45-75	0	0	0	0	0	0	0	0	4	12-16
747	Pig	Fishbourne (FB61-68)	AD75-80	0	7	7	0	0	0	4	0	0	2
476	Pig	Fishbourne (FB61-68)	AD75-80	0	7	7	0	0	0	4	0	0	2
1065	Pig	Fishbourne (FB61-68)	AD75-80	0	0	8	0	0	0	6	0	0	4-7
1057	Pig	Fishbourne (FB61-68)	AD75-80	0	0	6	0	0	0	0	0	0	1
756	Pig	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	8	6	0	12-13

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
755	Pig	Fishbourne (FB61-68)	AD75-80	0	0	8	0	3	3	0	0	0	8
754	Pig	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	0	7	0	12-18
10856	Pig	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	8	8	5	18-24
10854	Pig	Fishbourne (FB61-68)	AD75-80	0	0	0	0	7	8	8	8	0	16-19
10899	Pig	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	8	8	7	30-38
10901	Pig	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	8	8	5	18-24
10872	Pig	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	8	5	2	10-12
10888	Pig	Fishbourne (FB61-68)	AD80-100	0	0	0	0	5	6	8	7	0	12
10868	Pig	Fishbourne (FB61-68)	AD80-100	0	0	0	4	5	5	8	6	0	12
10864	Pig	Fishbourne (FB61-68)	AD80-100	0	0	0	0	0	0	8	4	0	7-12
10867	Pig	Fishbourne (FB61-68)	AD80-100	7	7	7	0	0	0	4	0	0	2
6240	Pig	Fishbourne (FB61-68)	AD80-100	0	0	0	0	0	0	0	8	4	16
7612	Pig	Fishbourne (FB61-68)	post-AD280	0	0	0	0	0	0	0	7	4	12-16
4443	Pig	Fishbourne (FB61-68)	post-AD280	0	7	7	0	0	0	0	0	0	3
10861	Pig	Fishbourne (FB61-68)	post-AD280	0	0	0	0	0	7	0	0	0	30-38
10853	Pig	Fishbourne (FB61-68)	post-AD280	0	0	8	0	0	4	8	5	0	10-12
10871	Pig	Fishbourne (FB61-68)	post-AD280	0	0	0	0	0	7	8	0	0	16
10851	Pig	Fishbourne (FB61-68)	post-AD280	0	0	6	0	0	0	0	0	0	1
542	Red deer	Fishbourne (FB61-68)	AD100-140	0	0	0	0	0	0	10	0	0	mature?
3553	Red deer	Fishbourne (FB61-68)	AD140-180	9	9	9	0	0	0	0	0	0	5-8
2874	Red deer	Fishbourne (FB61-68)	AD43-75	0	0	0	0	0	0	10	0	0	27+
3607	Red deer	Fishbourne (FB61-68)	AD45-75	0	0	0	0	0	0	10	9	0	16-34
1883	Red deer	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	0	0	9	27-43
10118	Roe deer	Fishbourne (FB61-68)	AD140-180	0	0	0	0	0	10	10	10	10	mature
10117	Roe deer	Fishbourne (FB61-68)	AD140-180	0	0	0	0	0	10	10	10	0	14+
651	Roe deer	Fishbourne (FB61-68)	AD180-250	0	0	0	10	10	10	10	10	10	mature
10113	Roe deer	Fishbourne (FB61-68)	AD43-45	0	0	0	0	10	0	0	10	10	14+
10121	Roe deer	Fishbourne (FB61-68)	AD43-75	0	0	0	0	0	0	10	10	10	mature
10120	Roe deer	Fishbourne (FB61-68)	AD45-75	0	0	0	0	0	0	10	10	10	mature
4779	Roe deer	Fishbourne (FB61-68)	AD45-75	0	0	0	0	9	0	10	10	0	13-16
10110	Roe deer	Fishbourne (FB61-68)	AD45-75	0	0	0	10	10	0	0	0	0	14+
10119	Roe deer	Fishbourne (FB61-68)	AD45-75	0	0	10	0	0	1	8	0	0	4-5
10115	Roe deer	Fishbourne (FB61-68)	AD75-80	0	0	0	0	0	0	10	10	10	mature
2398	Roe deer	Fishbourne (FB61-68)	AD75-80	0	10	10	0	5	5	10	0	0	7-8
10114	Roe deer	Fishbourne (FB61-68)	AD80-100	0	0	0	0	0	0	0	10	10	mature
10112	Roe deer	Fishbourne (FB61-68)	AD80-100	0	0	0	0	0	6	0	10	0	9-10
4895	Roe deer	Fishbourne (FB61-68)	AD80-100	10	10	10	0	3	3	9	8	0	5-7
10111	Roe deer	Fishbourne (FB61-68)	post-AD280	0	0	0	10	10	10	10	10	0	14+
8321	Pig	Fishbourne (FB92)	0-AD75	0	0	0	0	0	7	8	7	5	16
9326	Pig	Fishbourne (FB92)	0-AD75	0	0	0	0	0	0	0	7	4	12-16
8275	Pig	Fishbourne (FB92)	0-AD75	0	0	0	0	0	0	0	8	6	24-26
8572	Pig	Fishbourne (FB92)	AD150-300	0	0	0	0	0	0	0	0	7	30-38
9411	Pig	Fishbourne (FB92)	AD150-300	0	0	0	0	0	0	0	7	0	12-18
12536	Pig	Fishbourne (FB98)	1stC.AD	0	0	8	0	0	3	7	4	0	7
12083	Pig	Fishbourne (FBA95)	1stC.AD	0	0	0	0	0	0	0	0	4	12-16
-3662	Caprine	Fishbourne (FBE95-02)	AD120-200	0	0	0	0	0	8	9	7	5	25
-1026	Caprine	Fishbourne (FBE95-02)	AD300-400	0	0	0	0	10	10	9	8	0	31-43
-1007	Caprine	Fishbourne (FBE95-02)	AD300-400	0	0	0	0	9	9	9	9	0	31-45

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
-728	Caprine	Fishbourne (FBE95-02)	AD300-400	0	0	0	10	10	10	10	8	6	31-32
1083	Caprine	Fishbourne (FBE95-02)	AD43-75	0	0	0	0	0	0	0	0	6	24-32
-2464	Caprine	Fishbourne (FBE95-02)	AD50-80	0	0	0	0	9	9	9	8	5	25
-3639	Caprine	Fishbourne (FBE95-02)	AD65-110	0	0	0	0	10	9	10	0	8	32-43
-3638	Caprine	Fishbourne (FBE95-02)	AD65-110	0	0	0	0	0	0	8	7	0	17-24
-3640	Caprine	Fishbourne (FBE95-02)	AD65-110	7	8	7	0	0	0	0	0	0	1
-3433	Caprine	Fishbourne (FBE95-02)	AD65-110	0	0	0	0	0	10	10	10	0	mature?
-1010	Caprine	Fishbourne (FBE95-02)	AD65-110	0	0	0	0	0	0	10	10	9	31-55
-3072	Caprine	Fishbourne (FBE95-02)	AD70-150	0	0	0	0	0	10	10	10	0	mature?
-1776	Caprine	Fishbourne (FBE95-02)	AD75-150	0	0	0	0	9	9	9	8	5	25
-333	Caprine	Fishbourne (FBE95-02)	AD75-150	0	0	0	0	9	8	10	8	0	31-32
-10981	Caprine	Fishbourne (FBE95-02)	AD75-150	0	0	10	5	5	5	9	6	5	22-23
-10982	Caprine	Fishbourne (FBE95-02)	AD75-150	0	0	10	3	5	6	9	6	0	22-23
-10983	Caprine	Fishbourne (FBE95-02)	AD75-150	10	10	10	2	2	3	8	6	0	18-20
-2047	Caprine	Fishbourne (FBE95-02)	AD75-150	0	0	0	5	5	5	8	0	0	17-24
-10984	Caprine	Fishbourne (FBE95-02)	AD75-150	0	0	0	5	6	6	9	7	5	22-24
1030	Caprine	Fishbourne (FBE95-02)	AD75-150	0	0	0	0	0	0	0	8	7	28-36
1028	Caprine	Fishbourne (FBE95-02)	AD75-150	0	0	0	0	0	0	6	0	0	5-10
1011	Caprine	Fishbourne (FBE95-02)	AD75-150	0	0	0	0	0	0	0	0	6	24-32
905**	Goat	Fishbourne (FBE95-02)	AD200-350	0	0	6	0	0	0	0	0	0	6-18
10834	Pig	Fishbourne (FBE95-02)	10BC-AD25	0	0	0	0	0	0	8	6	0	12-13
10828	Pig	Fishbourne (FBE95-02)	10BC-AD25	0	0	0	3	5	5	8	5	2	12
10846	Pig	Fishbourne (FBE95-02)	10BC-AD25	0	0	0	0	0	0	0	0	4	12-16
10844	Pig	Fishbourne (FBE95-02)	10BC-AD25	0	0	0	0	8	8	8	8	4	12-16
10831	Pig	Fishbourne (FBE95-02)	AD140-200	0	0	0	0	0	0	0	8	7	30-38
10827	Pig	Fishbourne (FBE95-02)	AD140-200	0	0	8	0	0	0	7	0	0	5-7
10809	Pig	Fishbourne (FBE95-02)	AD150-200	0	0	8	0	0	5	8	7	4	12
10807	Pig	Fishbourne (FBE95-02)	AD200-300	0	0	0	0	7	7	8	7	0	16
10815	Pig	Fishbourne (FBE95-02)	AD50-80	0	0	0	5	6	0	0	8	3	12-13
10814	Pig	Fishbourne (FBE95-02)	AD50-80	0	0	0	0	7	8	8	8	5	18-19
10811	Pig	Fishbourne (FBE95-02)	AD70-150	0	8	8	0	1	0	6	0	0	5-7
10825	Pig	Fishbourne (FBE95-02)	AD75-150	8	8	8	4	5	6	8	0	0	12
10821	Pig	Fishbourne (FBE95-02)	AD75-150	0	0	0	0	0	0	8	7	0	12-18
10823	Pig	Fishbourne (FBE95-02)	AD75-150	0	8	8	3	4	4	0	0	0	10-13
10841	Pig	Fishbourne (FBE95-02)	AD75-150	0	0	7	0	0	0	0	0	0	3
10832	Pig	Fishbourne (FBE95-02)	AD75-150	0	8	8	0	0	1	5	0	0	4-5
10840	Pig	Fishbourne (FBE95-02)	AD75-150	0	0	8	0	0	0	0	0	0	2-4
1098	Red deer	Fishbourne (FBE95-02)	AD75-150	0	0	0	0	0	0	0	0	10	mature
1082*	Sheep	Fishbourne (FBE95-02)	AD43-75	0	0	10	0	0	5	7	0	0	10-11
9880	Caprine	Fishbourne Harbour	AD150-300	0	10	10	1	2	3	8	6	0	18
9740	Caprine	Fishbourne Harbour	AD150-300	0	0	0	0	9	9	9	8	7	31-43
9841	Caprine	Fishbourne Harbour	AD150-300	0	0	0	0	0	0	0	0	8	32-43
9739	Caprine	Fishbourne Harbour	AD150-300	0	0	0	0	0	0	0	6	0	15-23
9630*	Sheep	Fishbourne Harbour	AD50-150	0	0	0	9	8	8	9	8	6	30-31
9540*	Sheep	Fishbourne Harbour	AD50-150	0	0	0	10	10	10	10	9	9	48-55
10574	Caprine	Lavant	1st-2ndC.AD	0	10	0	1	1	3	8	6	0	15-18
10643	Caprine	Lavant	1st-2ndC.AD	0	0	0	0	0	0	9	8	7	28-43
11299	Caprine	Lavant	1st-2ndC.AD	0	0	0	0	10	10	10	10	10	mature

specimen	species	site	date/phase	dp2	dp3	dp4	pm2	pm3	pm4	m1	m2	m3	estimated age (months)
10718	Caprine	Lavant	1stC.AD	0	0	0	0	10	10	10	9	9	31-55
10719	Caprine	Lavant	1stC.AD	0	0	0	0	0	10	0	9	9	31-55
10646*	Sheep	Lavant	1st-2ndC.AD	0	0	7	0	0	0	4	0	0	1
10645*	Sheep	Lavant	1st-2ndC.AD	9	9	9	0	0	0	7	4	0	8-10
10729*	Sheep	Lavant	1st-2ndC.AD	10	9	9	0	0	0	7	0	0	10-11
13432	Caprine	North Bersted	200BC-0	0	0	0	0	0	0	0	6	5	17-23
13434	Caprine	North Bersted	200BC-0	0	0	9	0	0	0	7	5	0	10-11
13431	Caprine	North Bersted	200BC-0	0	0	0	10	10	10	10	10	10	mature
13436	Caprine	North Bersted	200BC-0	0	0	0	10	10	10	9	9	6	31-32
13428	Caprine	North Bersted	200BC-0	0	0	0	0	9	9	9	7	5	17-25
13435	Caprine	North Bersted	200BC-0	0	0	0	0	0	0	0	5	0	8-11
13429	Caprine	North Bersted	200BC-0	0	0	0	0	0	0	0	0	5	17-25
13427	Caprine	North Bersted	200BC-0	0	0	0	0	0	0	0	5	0	8-11
13433	Caprine	North Bersted	200BC-0	0	0	0	0	0	10	10	8	6	31-32
13430*	Sheep	North Bersted	200BC-0	10	10	9	0	0	0	6	4	0	6-8
10788	Caprine	Oving	0-AD200	0	0	10	0	3	5	8	6	4	17-20
10779	Caprine	Oving	0-AD200	10	10	0	0	1	1	0	0	0	15
10749	Caprine	Oving	0-AD200	0	0	0	0	0	8	9	7	7	26-28
10796	Caprine	Oving	0-AD200	0	0	0	0	9	9	9	7	5	22-25
10798	Caprine	Oving	0-AD200	0	0	0	0	2	3	8	6	0	18-20
10797	Caprine	Oving	0-AD200	0	0	0	0	0	0	8	7	6	24
10790	Caprine	Oving	0-AD200	0	0	0	0	0	0	0	10	10	mature
10771	Caprine	Oving	200BC-0	0	0	0	0	10	10	10	9	8	32-43
10750	Caprine	Oving	200BC-0	0	0	0	0	10	10	9	9	0	31-45
10741	Caprine	Oving	200BC-0	0	0	0	0	10	10	10	0	0	mature
10742	Caprine	Oving	200BC-0	0	0	0	0	0	10	9	9	9	31-45
10740	Caprine	Oving	200BC-0	0	0	0	0	0	10	10	10	10	mature
10746	Caprine	Oving	200BC-0	0	8	8	0	0	0	0	0	0	28-31
10754	Caprine	Oving	200BC-0	0	0	0	0	0	0	9	7	6	24-26
10753	Caprine	Oving	200BC-0	0	0	0	0	0	0	0	8	8	32-43
13467	Caprine	Oving	200BC-0	0	0	0	0	0	0	0	6	0	15-23
10764	Pig	Oving	200BC-0	0	8	8	0	1	1	0	0	0	5-6
10786*	Sheep	Oving	0-AD200	0	0	10	0	1	3	8	6	0	18-20
10785*	Sheep	Oving	0-AD200	0	0	10	0	1	1	8	6	0	15
10767*	Sheep	Oving	200BC-0	10	10	9	0	0	0	5	0	0	10-11
10770*	Sheep	Oving	200BC-0	0	10	10	0	2	2	8	6	0	17-20
10768*	Sheep	Oving	200BC-0	10	10	9	0	0	0	5	0	0	10-11
10745*	Sheep	Oving	200BC-0	0	0	10	2	3	5	8	6	0	17-20
10757*	Sheep	Oving	200BC-0	9	9	8	0	0	0	5	3	0	5
10756*	Sheep	Oving	200BC-0	10	9	9	0	0	0	0	0	0	10-11